THE IRON AGE

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Manufacturing Cold Drawn Steel Shells

New Plant of the Prest-O-Lite Company, Indianapolis, Making Tanks for Distributing Acetylene Gas for Lighting and Welding Purposes

The greatly increased use of acetylene gas for automobile lighting systems and the more recent consumption of the same gas for welding and cutting metals have made essential the economical manufacture of the shells in which the gas is distributed. Prior to the spring of this year the Prest-O-Lite Company was dependent upon scattered plants for its supply of tanks and was also handicapped by the isolated location of its gas-generating station. The necessity for a well-located and suitably designed plant became obvious as the requirements of distribution and service assumed larger proportions, with the result that the one illustrated in Fig. 2 is now in operation with capacity for making 1200 shells daily. The site upon which this plant is built comprises about 300 acres and was chosen because of shipping facilities available over both the Big Four and the Cincinnati, Hamilton & Dayton railroads. The acreage provides for a liberal plant extension and also for the improvement of a section now being subdivided for the building of employees' dwellings. At the present time special provision is made for the transportation of employees from the city by way of the suburban line which passes the plant.

The arrangement and design of the buildings are adapted to the particular requirements demanded for the manufacture and charging of the Prest-O-Lite shells. The design also represents a maximum consideration of the advantages of adequate light and ventilation, to secure which a one-story construction was adopted. With the exception of one section 80 x 300 ft. of the main manufacturing building, two-story construction was eliminated for the additional reason that most of the machinery to be installed was so heavy as to make its location on the ground floor practically necessary. Confining the manufacturing operations to one floor also made possible the

Fig. 1—The Special Coke-Burning Furnaces Provided for Brazing the Valve Bushing in the Top Head of the Shell

Fig. 2—General View of the Prest-o-Lite Plant Showing the Two-Story Building at the Left with the Office Beyond and the High-Monitor or Two-Story-Like Structure of the Hydraulic Press Department at the Right

freer handling of the shells between operations on an industrial trackage system which extends to all departments as indicated in the map of the works, Fig. 4. The preliminary studies of the plant and its subsequent design were worked out by Lockwood, Greene & Company, engineers, who also supervised the construction. Reinforced concrete construction has been used throughout, the reinforcing steel being furnished by and in accordance with the designs of the Pittsburgh Steel Products Company. All of the sash in the manufacturing buildings are of steel of the type built by the United Steel Products Company, Detroit, the roof monitors being equipped with center hung continuous sash of the same type. The floor construction in general is granolithic except in the brazing department where a brick floor has been laid, and in the pickling department where an asphalt mastic floor has been put down. The construction is thus fireproof throughout.

The large and continuous floor area made it necessary to secure a proper lighting of the factory by means of a roof, designed with that primary object in view. This arrangement is accordingly of special interest. The map of the buildings indicates their sizes and arrangement. The main manufacturing building has a total length of about 425 ft. Of this length a section 300 ft. long, is built two stories high to provide on the second floor for the general machining of the small tank connections. Paralleling this main building a section of the floor 20 ft. wide is roofed over with a skylight, at the hight of one story, through which light is distributed to the first floor of the main building. The rest of the building, or more properly, the wings, is covered by a series of parallel monitors, a section through which is shown in Fig. 4. These monitors parallel the skylight previously mentioned with the exception of one high monitor 75 ft. wide by 120 ft. long made especially high to provide clearance overhead for the hydraulic presses. The hight of the factory between floors is 16 ft. while the monitors are 24 ft. to the top of the roof with the exception of the high monitor which is 35 ft. to the underside of the roof slabs.

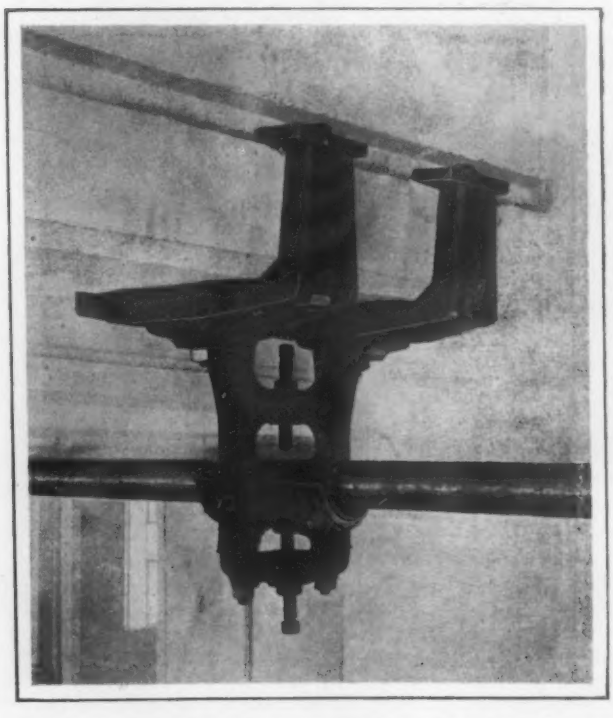

Fig. 3—The Method of Fastening Shafting Hangers to Concrete Beams

In the design of the buildings, one feature of the concrete beams is illustrated in Fig. 3. A groove 1 in. deep and 1½ in. high is cast on each side of each beam about 6 in. above the bottom of the beam. This is done at the time of building the forms and does not add to the cost. By use of the cast-iron clamps, such as are shown in the illustration, the transmission hangers can be hung from any point in the length of the beam.

Shipping facilities are comprised in the two terminal spurs from the railroads which serve the plant. The principal switch parallels a continuous concrete platform 10 ft. wide and 700 ft. long at car floor hight, the platform being a part of the main building and at the same level as the building floors. Both incoming and outgoing cars are handled here. The second switch is brought in between the power house on one side and the steel sheet and plate storage house on the other, the arrangement being such that coal may be unloaded into the bunkers and steel into the warehouse directly from the cars.

The steel for the shells is a low-carbon deep-drawing open-hearth steel and is received from the mill in circles varying in diameter from 20 to 35 in. For a tank 6 x 16 in. a circle 20 in. in diameter is used. For a 6 x 20-in. tank a 22-in. circle; for a 7½ x 22-in. tank, a 24-in. circle. All of these sizes are shells for lighting purposes. For the welding apparatus a shell 8 x 30 in., made from a 32-in. circle, or a shell 12 x 36 in., drawn from a 35-in. circle, 5/16 in. thick is used. The shell used for the motorcycle is 4 x 13⅜ in. and is made from seamless steel tubes, both heads being welded on.

The making of a standard 7½ x 22-in. shell is typical of the general process of manufacture and of the operations involved. The tanks are made with a seamless drawn shell including one head, the other head being brazed on. The dangers of storing acetylene gas alone under pressure in these shells is eliminated by filling the tank with porous asbestos disks. Into these disks a fixed quantity of acetone by weight is absorbed. This acetone has the well-known quality of being able to dissolve at atmospheric pressure 25 times its own volume of acetylene gas. The shell in commercial use, while containing acetylene gas at 15 atmospheres when freshly charged, holds that gas completely dissolved throughout the interstices of the asbestos disks.

From the steel storage the steel circles are transported on Koppel steel platform cars on 21½-in. gauge industrial track to the hydraulic forming presses. These presses and the platform on which they are mounted are shown in Fig. 5. Hand hoist trolleys are hung over the platform for lifting off cylinder heads and transferring dies to and from the machine shop. The platform is 32 in. above the floor and provides for a working area around each press of 20 x 25 ft. There are four 500-ton hydraulic presses, two 16-in., and two 14-in., capable of exerting a pressure of 4000 lb. per sq. in. Each press is individually driven by an hydraulic pump, three of which are steam driven and the fourth motor driven, the latter provision being made to meet occasions which require the operation of a press when the boilers are down. The hydraulic equipment was built by the Charles F. Elmes Engineering Works, Chicago.

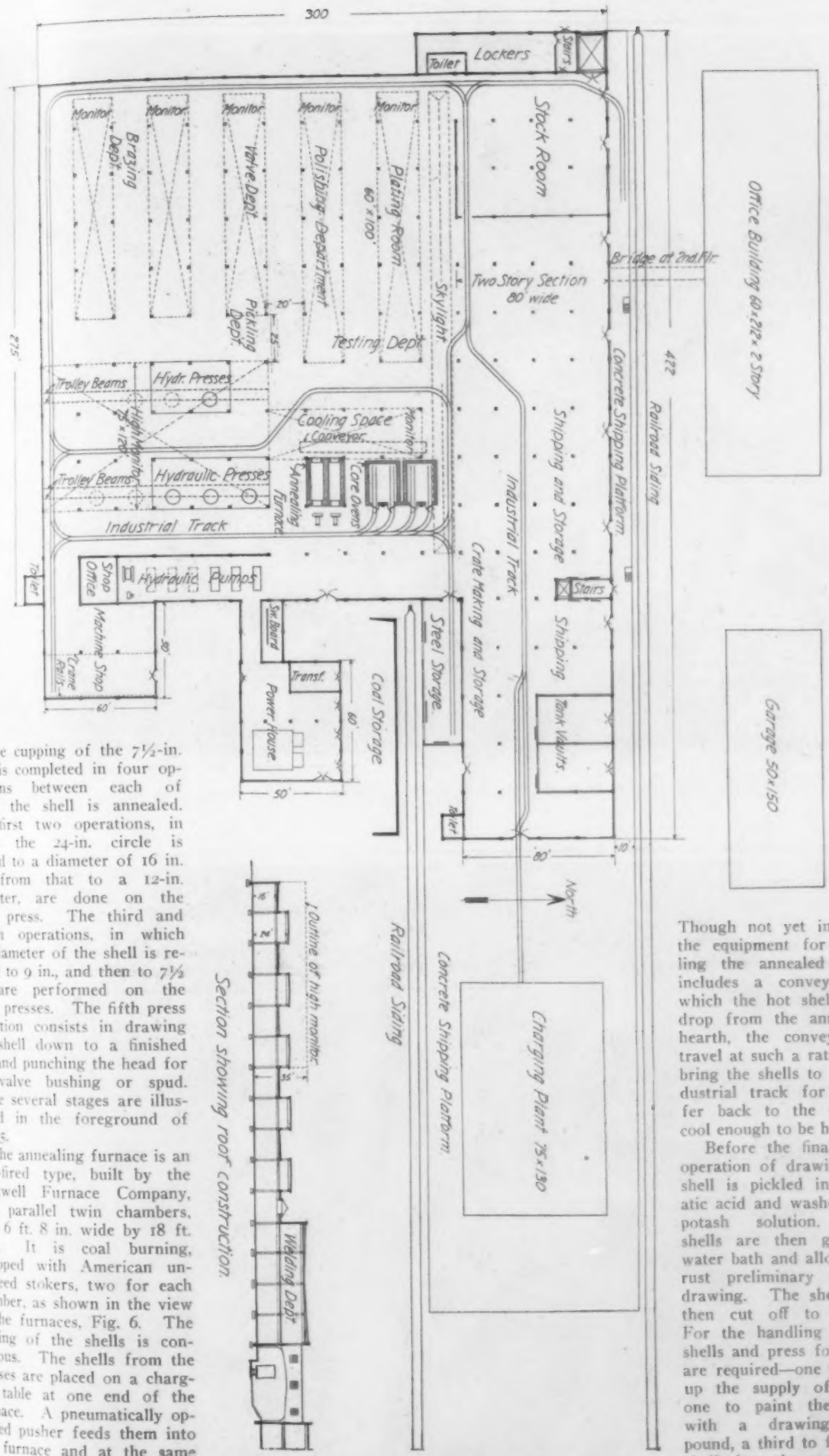

Fig. 4—General Plan of the Prest-O-Lite Plant, Showing Also a Cross Section of the Roof Construction

The cupping of the 7½-in. shell is completed in four operations between each of which the shell is annealed. The first two operations, in which the 24-in. circle is cupped to a diameter of 16 in. and from that to a 12-in. diameter, are done on the 16-in. press. The third and fourth operations, in which the diameter of the shell is reduced to 9 in., and then to 7½ in., are performed on the 14-in. presses. The fifth press operation consists in drawing this shell down to a finished size and punching the head for the valve bushing or spud. These several stages are illustrated in the foreground of Fig. 5.

The annealing furnace is an over-fired type, built by the Rockwell Furnace Company, with parallel twin chambers, each 6 ft. 8 in. wide by 18 ft. long. It is coal burning, equipped with American underfeed stokers, two for each chamber, as shown in the view of the furnaces, Fig. 6. The heating of the shells is continuous. The shells from the presses are placed on a charging table at one end of the furnace. A pneumatically operated pusher feeds them into the furnace and at the same time forces the annealed shells out at the opposite end. The doors of the furnace are also pneumatically controlled. The shells are subjected to a temperature of about 1625 deg. for an interval of 15 min.

Though not yet installed the equipment for handling the annealed shells includes a conveyor on which the hot shells will drop from the annealing hearth, the conveyor to travel at such a rate as to bring the shells to the industrial track for transfer back to the presses cool enough to be handled.

Before the final press operation of drawing, the shell is pickled in muriatic acid and washed in a potash solution. The shells are then given a water bath and allowed to rust preliminary to the drawing. The shells are then cut off to length. For the handling of the shells and press four men are required—one to keep up the supply of stock, one to paint the shells with a drawing compound, a third to feed the shells into the press, and a fourth to control the operating valve. The shells from the cutting-off lathe slide by gravity into a reversed electrolytic bath, where the grease is removed.

Fig. 5—Operating Platform for the Two 16-In. and One 16-In. Hydraulic Presses; in the Foreground are Shown the Stages in the Forming Operation

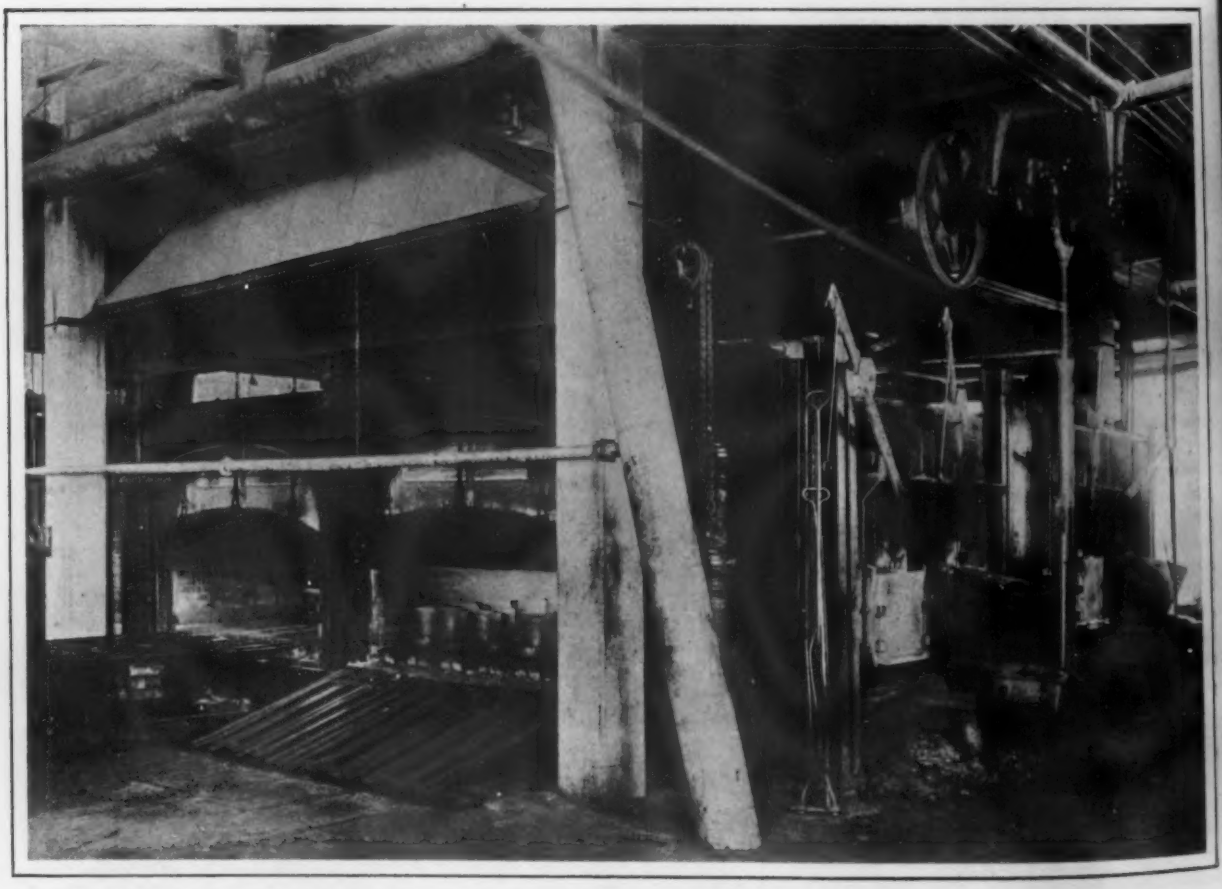

Fig. 6—Discharge End of the Rockwell Coal-Burning Stoker-Fired Annealing Furnaces. The Manner of Placing the Pieces in the Furnace is Shown

Fig. 7—The Group of Special Pre-heating and Brazing Furnaces for Brazing the Bottom Heads in the Shell

Fig. 8—View Showing the Insertion of the Top Valve Stem Into the Prest-O-Lite Cylinders and Soldering it in Place

The insertion of the spud, which is turned up from bar stock on screw machines so as to be clinched in the head for subsequent brazing, is a simple operation.

The furnaces on which the spuds are brazed into the heads are shown in Fig. 1. They are coke-burning furnaces with four circular top openings in which the shells rest in a vertical position. A tap is run through the thread of the bushing to clean it up after brazing. The open end of the shell is then annealed in a lead bath prior to the brazing in of the bottom head of the tank. The shell is then filled with the asbestos disks which are forced in with a driving fit. The inserted head is a dished stamping and is set in the shell by hand, after which the edge of the shell is crimped over in a light power press. The brazing compound is applied at the same time.

The furnaces for brazing in the bottom heads are illustrated in Fig. 7. In the present installation there are six. Oil is used for fuel. The furnaces are built with two chambers. The one nearest the burner and rectangular in shape is a preheating chamber in which the shells are placed first. From this chamber the flame passes through an aperture into the brazing chamber which is circular. The flame enters at an angle so that it assumes a whirling motion, circling about the shells and providing an even heat at all points of their circumference. The shells are then set out to cool when the brazed joint is smoothed up, plugs are screwed into the top and bottom spuds and the shells are again pickled and washed in potash.

Fig. 8 shows the section in which the reducing valves are soldered into the heads. The soldering torches are hung from above and have two burners, one of which is heating one valve while the other is making the joint. The solder is in the form of a wire hung on a spool suspended above. After the valve has been assembled in the shell, another pickling and washing operation immediately precedes the buffing, for which the machines and rigs shown in Fig. 9 are provided.

An unusually thorough plating process characterizes the finishing of these shells. They are made in two finishes—copper and nickel. Where the finish is to be copper, a preliminary dipping for one-half minute in a cyanide solution gives the tank a foundation coating of copper on which to plate the nickel coating. Where the finish copper the foundation copper coating is much heavi The buffing of the shell after the first copper or nic plating is dependent upon the finish desired. Prior to t immersion for the last bath, a name-plate imprinted wi ink, impervious to the action of the electrolyte bath, is p pressed on the shell. When the finishing surface has be put on the ink washes off, permitting the contrasti foundation plating to show through, thus making a pe manent name plate. After the shells have been plat and buffed they are tested under water with an air pre sure of 500 lb.

Impregnating the disks within the shells with aceto is accomplished by exhausting the shells until a vacuu of about 17 in. is secured. A fixed weight of acetone, which means the volume of acetylene is regulated, is th drawn into the shell through a tube. The shells are th charged with acetylene in an isolated building. The ma ner in which the tanks are arranged in racks is shown Fig. 10. Inasmuch as the tension of the gas in the she increases directly with the temperature it is necessary

Fig. 9—General View of the Buffing and Polishing Department, Where the Cylinders are Burnished for Plating. The Plating Tanks ar Immediately at the Left

keep the latter constant by means of continuous water sprays in order that the pressure may not indicate too great a weight of gas charged.

The generating station is remote to provide for the convenient disposition of the slacked carbide and the gas is piped to the charging plant, a distance of about ½ mile. A very dry gas is an important essential from the standpoint of both weight and proper burning. Before charging, the gas is therefore passed through dryers filled with carbide so that the moisture will react to form additional gas. It then passes through large hooded dryers filled with a fine drying powder and then through equalizing check valves to another set of calcium chloride dryers. The compression of the gas for charging is secured by means of four Norwalk three-stage compressors arranged with intercoolers to keep the temperature of the gas down. The compressed gas then passes through a four-stage oil trap and chloride dryer before going to the tanks. Each compressor carries 640 shells as a charging load and the time required to complete the charge to a tension of 15 atmospheres is approximately 8 hr.

Fig. 10—One Section of the Charging Plant. The Cylinders are Sprinkled with Water Continuously to Keep the Temperature Constant While Charging. The Larger Cylinders are Those Used for Welding Apparatus

All that the Prest-O-Lite Company has done in the improvement of its manufacturing facilities have been entirely incidental to the proposition of improving its service in the distribution of gas, both for welding and lighting. There are in reserve at the factory and at the exchange depots all over the countyr charged shells equivalent in number to one and one-half times the number of shells actually in service. Fig. 11 shows one of the storage vaults at the factory. A new arrangement affecting welding outfits has been inaugurated whereby the first cost is limited to the moderate cost of torches and reducing valves. The shells are simply leased upon terms which are equivalent to the payment of so much per foot of gas used.

The Acklin Stamping Company, 1645 to 1653 Dorr street, Toledo, Ohio, to meet requirements of its increasing business, has erected a large warehouse and shipping room. The building, which has just been completed, is of modern construction and thoroughly equipped with appliances for the rapid and economical handling of sheets and bars used in the manufacture of various stampings required by the customers of the company. The building affords storage facilities for about 1500 tons of metal. By carrying so large a stock the company will be enabled to serve its customers promptly.

Fig. 11—One of the Storage Vaults, a Feature of the Service Rendered in Maintaining an Ample Supply for Acetylene

A Brief for Composition Flooring

The case of composition flooring was upheld at length in a paper presented before the Structural Section of the Engineers' Society of Western Pennsylvania, Pittsburgh, on September 8, by H. M. Hooker, district manager of the Marbleloid Company, Pittsburgh. He discussed 19 kinds of flooring from the standpoint of 18 different properties possessed by floors, as follows: Cleanliness, that is, the sanitary properties of a floor; quietness; relative immunity from abrasion; relative resilience of a flooring material; relative immunity from slipperiness; appearance; relative degree to which the floor is waterproof; relative plasticity; relative heat insulating properties; resistance to acids; resistance to alkalies; resistance to fire; elasticity of the material; crushing strength; structural strength, having in mind what may be called its beam value; immunity from expansion or contraction, and the relative weights.

The 19 kinds of flooring were tabulated under each one of these heads, according to the author's own method of valuation, and he finally arrived at the following relative values of the flooring materials enumerated, for average conditions, regardless of cost: Composition flooring, 82; cork tile, 72; linoleum, 70; oak, 63; maple, 63; white pine, 62; yellow pine, 59; asphalt, 54; marble, 52; rubber tile, 49; slate, 45; clay tile, 43; terrazzo, 43; mosaic tile, 42; Portland cement concrete, 42; limestone, 40; paving brick, 33; face brick, 30; common brick, 25. As regards the cost of composition flooring, he gave a table of the comparative prices for composition flooring and some other standard flooring materials in 1912, based on areas of 1000 sq. ft. and 10 times that amount. The charge for composition flooring, he stated, is usually between 20 and 50 cents per square foot. It is about one and one-half times the price of a wood floor when on a wood foundation, but on a concrete foundation the cost of wooden and composition flooring, he said, is about the same, as the latter can generally be set off against the cost of wood sleepers, cinder concrete fill between sleepers and the hardwood finish. The table of prices is as follows:

Prices of Different Flooring Materials per Square Foot

	For 1,000 sq. ft.	For 10,000 sq. ft.
Marble	$1.25	$1.00
Cork tile	.85	.75
Rubber tile	.60	.50
Tile; clay, ceramic, encaustic	.60	.50
Mosaic tile	.60	.50
Slate	.50	.45
Terrazzo	.40	.35
Composition flooring	.33	.25
Wood, hard maple	.18	.16
Asphalt	.25	.15
Linoleum	.12	.10
Portland cement, mortar finish	.08	.06

Survey of Pittsburgh Manufacturing Plants

The first systematic survey of the Pittsburgh industrial district by the commonwealth of Pennsylvania will be started within a few weeks by Commissioner of Labor and Industry John Price Jackson. Every industrial establishment will be inspected, and the commissioner says he will welcome the co-operation of employer and employee. The surveys have been working out well in other cities, not only furnishing the State with important information but bringing about better relations between the manufacturers and employees. Under the plan adopted a day will be fixed on which the commissioner, bureau chiefs, resident inspectors and probably those from a dozen districts about Pittsburgh will gather for a meeting, and the city will be divided into sections, each of which will be visited by two inspectors, for the purpose of ascertaining how safety, employment and sanitary laws are being carried out. Where safety devices for the protection of employees, fire escapes and other facilities for the prevention of accidents are needed they will be recommended.

The Ætna Foundry & Machine Company, Warren, Ohio, is building the hydraulic door lifts, 16 pit covers with operating mechanism, and an ingot chariot and drive for the new plant of the Brier Hill Steel Company, Youngstown, Ohio. The same builder has recently completed 42 four-hole ingot cars for the Brier Hill Company.

The Tool Room in Scientific Management

The Importance of the Relation Existing Between the Tool Room and the Shop as Regards Maximum Production

BY ROBERT THURSTON KENT*

The tool room in a shop operating under scientific management is a very different place from the ordinary tool room, which frequently is only a storage space for the more expensive tools, jigs and measuring devices used in the shop. One reason for this is that under scientific management the definition of the word "tool" is extended to cover a much wider range than it ordinarily does. Everything concerned with the actual production of the shop, excepting such permanent equipment as machine tools, power transmission machinery, etc., is regarded as a tool, and as such is under the supervision of and is stored in the tool room. This extension of the meaning of tool thus brings into the tool room many things which are usually regarded as a portion of the equipment of individual machines; for instance, the holding-down bolts, straps, U-clamps and blocks used in connection with planer work.

Relation Between the Tool Room and the Task

Another reason for the difference between the ordinary tool room and the scientifically managed one is based on one of the fundamental requirements of scientific management—the setting of tasks to be accomplished in a definite period of time. The task, as defined by Taylor, "should not be easy of accomplishment." It is impossible of accomplishment unless the tools and equipment specified for the job are in first-class condition, standardized and, in the case of cutting tools, of the proper shape and ground to certain definite angles. With tools of this character, feeds, speeds and depths of cut can be specified for any given operation with the certainty that they can be maintained. With the tools in the proper condition, the time required for handling them can be predicted. As both cutting time and handling time are important factors in the task, it is obvious that if the cut specified cannot be maintained, or if any great amount of time be lost in handling, the workman will fail to accomplish his task, and consequently will lose the bonus which he would otherwise receive.

Effect of Poor Condition of Tools

As an instance of the effect of imperfect tool condition on handling time let us consider planer work for a moment.

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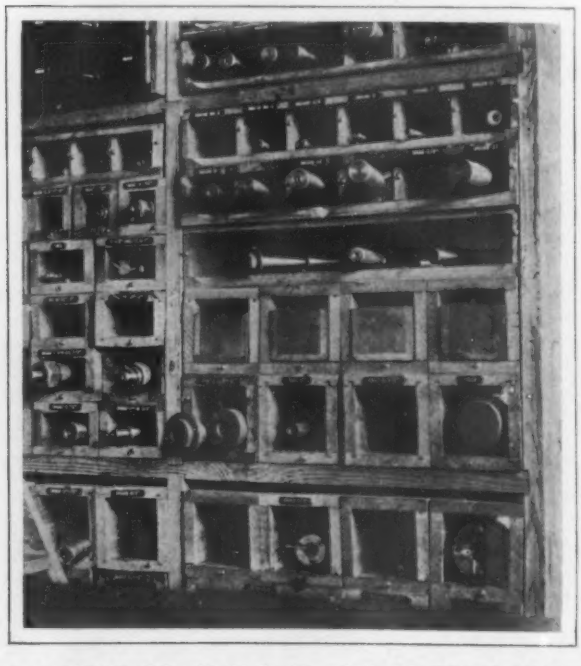


Fig. 1—Method of Storing Boring Bars in Standard Box Subdivisions

Fig. 2—Combination of Trays, Boxes and Drawers Fitted into Standard Tool Room Bin

The usual method of holding work on the planer table is to use strap or U-clamps, the toe of which rests on the work, the heel being placed on a wood or metal block of approximately the same hight as the work. A bolt set in the T-slot of the table, passing through the strap, holds the work firm on the table. The time which scientific management would allow for setting up a piece on the planer would make no allowance for running the nut down on the bolt any further than the thickness of the nut, nor would it make any allowance for the time required for the use of a wrench to run the nut down the entire distance. It would expect the machinist to run the nut down quickly to the surface of the strap with his fingers and only to use the wrench to tighten the nut on the strap. Nor would it make any allowance for adjusting a monkey wrench; the machinist would be expected to use a spanner wrench which fits the nut. Further, no time would be allowed to build up blocking of suitable hight, from a miscellaneous collection of straps, parallels, large nuts, etc. A single block, or at most two, with sides parallel is expected to be used, such blocks requiring much less time to place than the built-up blocking so often found. It is obvious that if scientific management makes no allowance for these conditions, which are usual, it must take steps to improve them.

It is in this improvement of conditions that the tool room in the shop using scientific management differs from others. One of the functions of the tool room is to provide all these pieces of miscellaneous equipment mentioned; another function is to see that they are in perfect condition when they are issued to the shop. Thus, when a job is to be done on the planer, the tool room will receive a list of the equipment necessary. This will include: the cutting tools; the necessary number of holding-down bolts, each with a nut and washer, and each of a length equal to the hight of the piece, plus the thickness of the strap plus the thickness of the nut, plus the thickness of the T-slot in the table, and the thread on the bolt will be in such a condition that the nut can be run down freely with the fingers; a spanner wrench to fit the nuts on the holding-down bolts; the requisite number of wooden blocks of the correct

right for the work in hand, and such gauges, measuring devices, etc., as may be necessary.

No time, therefore, is lost by the machinist in forcing nuts on damaged threads, in looking for clamps, straps, bolts or blocking. Every facility is provided for him to accomplish the setting up of his work in the minimum of time, and if he does not do so it is not the fault of the equipment. On the completion of the job all the bolts, blocks, etc., are returned to the tool room, where they are carefully inspected and repaired before being reissued. If threads are damaged, a die is run over them. If the

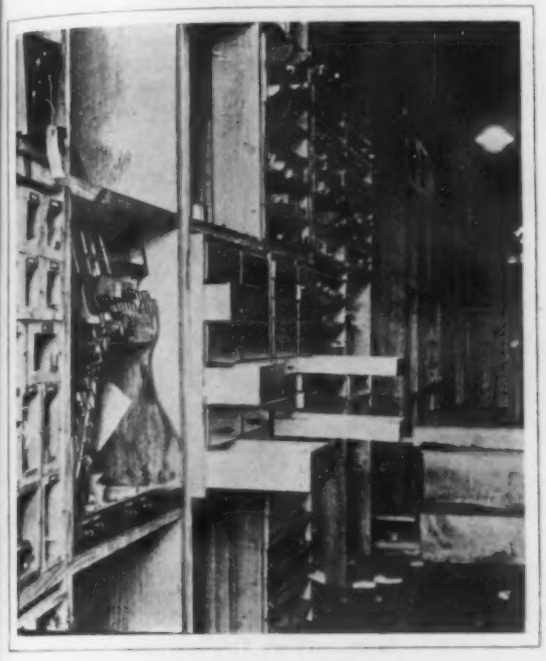


Fig. 3—Rack for Storage of Micrometers and Snap Gauges; Note the Inverted Hook for the Workman's Check

blocks have been splintered, they are planed down to the next size. If the straps are bent, they are straightened. Cutting tools are reground, and gauges and measuring tools are inspected and errors in them rectified before they are permitted to go into the shop again.

Changes in Tool Room Made by Scientific Management

It is evident that scientific management thus extends to a great degree the usual scope of the tool room. It includes within it many things which were formerly outside, and it imposes on it new duties of inspection and repair of minor equipment. This extension of the tool room has necessitated considerable change in its physical aspect and not a little in the system of indexing and recording tools. Due to the great increase in the size of the tool room, a method had to be devised which would provide a place for everything and enable any article to be readily located. The two problems thus presented have been solved by building the tool room bins and racks on the unit system, capable of indefinite expansion, and by making use of a mnemonic classification of tools, which is self-indexing. We will consider the last feature first.

The Mnemonic Classification of Tools

The mnemonic classification used in tool rooms under scientific management is based on the Dewey decimal system. That is, all tools are divided into a number of broad general classes, peculiar to the industry in which they are used. These broad classes are subdivided into subclasses which are still further subdivided and re-subdivided until the individual tool is reached. Each main division is indicated by a letter, and each subdivision is also indicated by a letter, one letter being added for each subdivision. The general classes into which tools used in machine shops are usually divided are as follows:

Table I—Classification of Tools

A—Miscellaneous tools, not elsewhere classified.
B—Bending Tools.—All tools for producing changes in shape by bending, folding, spinning, etc.
C—Drilling and Boring Tools.—Tools that remove metal from the interior, such as drills, boring bars, cutters and all appliances relating to them and lathe boring tools.
E—Edge Tools.—Edge tools for working wood and tools for working plastic materials, such as clay, molding sand, putty, etc.
F—Heating Tools.—All kinds of tools used for heating, lighting, melting, molding, oil tempering, annealing, drying, cooking, etc.
H—Hammers and all tools that work by striking or being struck, such as sledges, taps, etc., chisels, sets, flatters, etc.
L—Transportation Tools.—All tools used in moving materials from one place to another, such as buckets, boxes, etc., trucks, shovels, wheelbarrows, bogies, brooms, riggers' tools, slings, chains, etc.
M—Measuring Tools.—All instruments of precision, weights, measures, gauges, etc., electrical instruments, etc.
P—Paring Tools.—All tools that remove metal from the surface by cutting except slotter and milling tools. (See class D for lathe boring tools.)
R—Milling Tools.—All tools for milling or sawing metal.
S—Slicing Tools.—All parting tools and slotter tools.
T—Templates and all instruments for duplicating work, including jigs and fixtures.
U—Abrading Tools.—All tools for rubbing, scraping, filing, grinding, shearing, punching, breaking, etc.
W—Wrenches and all tools used for causing rotation.
X—Painting Tools.—All tools used for covering a surface with an adhesive foreign material, and any for removing same.

Each letter of the classification above exhibited is used as the index of a separate sheet of the classification book, on which appears the subdivision of this particular class. Each of these subdivisions is then made the index of still other sheets, each one of which is again subdivided. This process continues until the symbol is completed.

For example, let us develop the symbol of a ¾-in. taper-shank twist drill. A drill evidently falls under the broad classification of drilling and boring tools, symbol D. Turning to the sheet indexed D we will find it subdivided DA, DB, DC, DD, etc. Running down these subdivisions, we find that under DD are included all drills, and that these are further classified on the sheet indexed DD. Examining the subdivisions under DD, the symbol for a twist drill is given as DDT, and for a flat drill as DDF. There is a sheet indexed DDT on which the various kinds of twist drills are classified, taper-shank twist drills being shown as DDTT and straight-shank twist drills as DDTS. Were it possible to subdivide these any further another sheet would be found in the classification book indexed DDTT or DDTS, as the case might be. As the symbol DDTT completely describes the drill, with the exception of the size, it is only necessary to prefix the fraction ¾ to the symbol in order to make known all of its physical characteristics and to locate it in the tool room, as will be shown.

In a similar manner the symbol for every tool can be learned or developed, or the symbol being known, the name of the tool can be learned. The classification as above described is kept in a loose-leaf book, alphabetically arranged. Thus on the first page is the general classification, outlined above. The second sheet is the subdivisions of the A class, the third sheet carries the subdivisions of the AA class, and so on. After all the subdivisions of the AA class have been made, the subdivisions of the AB class appear; after the AB subdivisions those of the AC class, continuing until every tool which is under the general

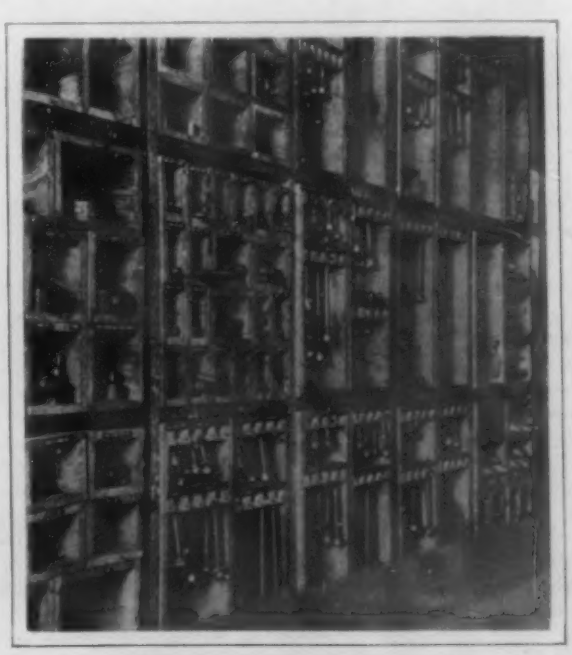


Fig. 4—Method of Storing Holding Down Bolts in Tool Room; Note that Each Bolt is Complete with Its Nut and Washer

heading A has been listed. Then follows the B class in the same manner, and so on until the classification is complete. It is obvious that this is a most flexible system which permits of indefinite expansion. The classification is an indispensable adjunct of the tool room if the tools are to be stored or located rapidly. With it the location of any tool can be almost instantly determined.

The Physical Arrangement of the Tool Room

Turning now to the physical arrangement of the tool room itself, let us see how it fits in with the classification. The tool racks consist of bins of standard size, which can be subdivided by means of trays, boxes and drawers to form receptacles of any desired size or shape to fit any kind of tool. The bins in the tool racks, which are made of sound lumber, planed on both sides, are made 24 in. square by 17 in. deep, inside measurements. The accompanying illustrations show several of the different forms of boxes which are used for subdivisions of the main racks.

The standard sizes of boxes used for subdivisions are given in Table II. The depth of each box is 17 in. and the dimensions in the table are in every case outside measurements.

Table II—Dimensions of Standard Boxes for Subdividing Tool Racks

Box No.	Width, in.	Hight, in.	Box No.	Width, in.	Hight, in.	Box No.	Width, in.	Hight, in.
1	24	24	6	12	12	11	8	6
2	24	12	7	12	8	12	8	4
3	24	8	8	12	6	13	6	6
4	24	6	9	12	4	14	6	4
5	24	4	10	8	8	15	4	

The trays used are respectively 6 x 24 in., 4 x 24 in. and 4 x 12 in. They are all 17 in. deep. The lower edge of each box and of each tray is preferably beveled at an angle of 45 deg., and a hook is attached to one side of the box or tray to receive the workman's check when a tool is issued. These hooks are inverted as shown in Fig. 2, as in this position it is impossible to accidentally knock the check off.

By a judicious use of the various sizes of boxes and trays, storage compartments of almost any desired form can be arranged. Special racks can be made and fitted into the standard bins or in any of the standard boxes for special purposes. As an instance, see the racks for micrometers in Fig. 3 and the method of storing bolts in Fig. 4. In this connection it should be noted that a bolt is always issued complete with nut and washer.

The large number of micrometers stored in the tool room illustrated herewith is worthy of some comment. It has been considered good practice to issue a micrometer with each equipment of tools whenever work is to be turned to a given dimension. One reason for this is that it has been found much quicker to set a micrometer to a dimension than to set calipers by the ordinary method of tapping them on a part of the machine. Another reason is that the micrometer gives the dimension called for exactly with no variation one way or the other, which is not true of the calipers. This practice involves a somewhat heavy investment in micrometers, but it has been found to pay.

Locating the Tools in the Tool Room

The prompt location of the tools in the tool room is accomplished by means of their symbols. Every tool has stamped on it, in large legible characters, the symbol which it bears according to the classification. Each box, tray or drawer should contain but one size and shape of tool. This last rule may be modified in the case of small drills, reamers, taps and similar tools, which are usually stored in drawers divided into compartments of suitable size and shape. In this case, however, each compartment should be limited to a single size of tool. The symbol of the tool contained in the box or compartment is marked plainly on such compartment in such a location as can readily be seen. Fig. 1 shows a good method of marking symbols. The label in this case consists of a thin aluminum plate, on which the letters and numbers of the symbol are stamped in raised characters by means of an ordinary name plate machine.

The tool room racks are arranged in alphabetical order, in exactly the same manner as the sheets in the classification book. That is, the first rack contains all the tools whose symbols begin with the letter A, the second all those commencing with the letter B, and so on. The subdivisions of each symbol are located in each rack also in alphabetical order, and the first letter of the symbol is prominently displayed on a projecting sign on each rack, so that it is visible from any point of the aisle alongside of the racks. Then, the symbol being known for any desired tool, it is a simple matter to locate the particular rack and the particular compartment in that rack which contains the tool.

On the other hand, if the tool is called for by name, the symbol being unknown, by means of the classification book the symbol can be quickly ascertained, as outlined previously, and the tool located as before. It is evident that this system of storing tools may be expanded as desired, as there are no permanent structures in the tool room excepting the racks, which are standard for all types of tools. Therefore, as the quantity of tools entrusted to the care of the tool room increases, it is only necessary to shift the comparatively small and light boxes and trays forming the subdivisions of the racks.

Inventory of Tools

In connection with its other duties the tool room under scientific management is charged with keeping a perpetual inventory of the tools. This inventory is made when the tool room is first established, and is maintained thereafter by constant checking. The planning room calls for a count of the tools in certain compartments each day, the count being arranged to cover every tool symbol at least twice a year. The report of the count shows the number of tools on hand in the tool room, the number in the shop, checked out to the men, and the number in the shop being repaired. This count is compared with the inventory record, and discrepancies are looked into at once. Every tool called for by the inventory must either be in the tool room or be represented there by either a workman's check or a repair check. Tools which have been worn out or damaged beyond repair are written off the inventory or replaced, but until this has been done the full number inventoried must be on hand or accounted for.

Checking Tools Out to Workmen

In issuing the tools, a check must be given by the workman for every piece. However, as in many cases, where a large number of items of the same symbol are issued, such as holding-down bolts, this would result in the use of an inordinately large number of checks being handled on one order, what are known as "denominational checks" are used. These are checks bearing on one side the workman's number, and on the other a large figure as 3, 5 or 10, which indicates that it is equivalent to that many of the single checks. These denominational checks are different in shape from the single checks, so that the tool room attendant knows immediately on handling it that it calls for more than one item to be returned.

When tools are returned to the tool room after use in the shop, they are first inspected, and if in need of repairs are sent to the proper department. In case repairs are necessary, a repair check, which is simply a brass tag with a large R stamped on it, replaces the workman's check on the compartment where the tool belongs. When the tool is returned it is replaced in the rack and the repair check removed. It is thus possible to tell exactly where each tool belonging in any given compartment is.

In checking out tools, either the single check or double check system may be used. With the former, when a tool is issued, the workman's check replaces it in the tool compartment. With the double check system, a board is provided on which are a series of hooks, each bearing a workman's number. When a tool is issued the workman's check replaces the tool as before, but in addition a check bearing the tool symbol is placed on the hook bearing the workman's number on the board. Thus it is possible to tell at any time just what tools a workman has in his possession. This is of value if a man leaves, or is transferred to another department of a large works, and although the double check system may at first glance appear cumbrous, it in reality involves little or no more work than the single check system.

Importance of Tool Maintenance

Inasmuch as scientific management prescribes speeds and feeds in machine work which can only be attained when

cutting tools are ground to certain predetermined an-
es,* it is essential that all tool grinding be done in the tool
om, or under its supervision. Otherwise there can be
certainty that the tool angles will be those requisite for
id production. As it is almost impossible to prevent
rkmen from trying to improve on the tools furnished
em from the tool room, as regards grinding, and as the
ject of scientific management will be defeated if the
ape of the tools is varied by the men, it is imperative
at all grindstones and emery wheels on which tools could

be ground be removed from the main shop, either to the tool room, or to a place where they are inaccessible to the men. Too much stress cannot be laid on this point. Many tools have been ruined and much tool-steel has been wasted by permitting the men to have access to a grindstone, and what is far more important, whenever they are allowed to attempt to grind their own tools, it invariably happens that they are not able to accomplish the results called for by the task. It is a practical impossibility for a workman to grind a tool by hand and get the same angle that will a tool grinder, which is mathematically exact.

It is thus evident that a tool grinder is one of the essential pieces of equipment for the tool room. A drill grinder should also be used if the best results are to be attained in drilling. These two machines should preferably be located in the tool room, although if there is lack of room therein they may be located in the shop, with a strict prohibition of their use, except under the tool-room's supervision.

In regard to tool repairs it is, as a general rule, advisable to have them made in the tool room as far as possible. This, however, requires the fitting up of a tool-making department, which is a machine shop in miniature. Unless the shop is a very large one, there will not be work enough to keep this repair department busy, and it would in that event prove an unprofitable investment. In smaller shops, employing up to, say, 200 men, the most satisfactory method is to have the work done in the main shop, under orders from the planning room.

The planning room will, of course, take care to route this repair work to those men and machines which are best fitted to do it. One precaution must be observed, however, with this plan. Tool repairs are apt to be looked on as a comparatively unimportant part of the shop's work, and they are often side-tracked for the regular production, being regarded as "fill-in" jobs. On the contrary, they represent one of the most important functions of the plant, and should take precedence over other work. If this is not done, and the tools awaiting repairs are allowed to accumulate, the shop is liable at any time to find itself held up on an important job for lack of tools to complete it.

The writer is indebted to the New England Butt Company, Providence, R. I., for the illustrations used in this article.

*See "The Art of Cutting Metals," by F. W. Taylor.

A Conveyor System Utilizing Gravity

Interesting Applications of a Number of Devices Operating in This Way

The commercializing of gravity is a feature of a line of conveying apparatus being put on the market by the Mathews Gravity Carrier Company, Ellwood City, Pa. The conveyors are made in several different types and by using them either singly or in various combinations it is possible to deliver incoming merchandise directly from the railroad cars to any point or points inside a group of buildings, or to reverse the process, if desired. Three different types of natural gravity carriers are shown in the

Fig. 1—A Gravity Carrier Employed for Conveying Pig Iron from a Car to the Stock Pile of the Northern Malleable Iron Company

Fig. 2—The Double Roller Helical Type of Conveyor

accompanying engravings, Fig. 1, illustrating the application of the idea to the handling of commodities between railroad cars and storage piles. Fig. 2 shows another of the devices which is known as the double roller gravity spiral, and in Fig. 3 a view of a combination system, consisting of straight lift and inclined elevators with a gravity conveyor connecting link, is given.

The handling of commodities such as pig iron, ingots, brick, paving and building blocks, etc., is the field for which the gravity conveyor illustrated in Fig. 1 is designed. This type of conveyor, which is shown in use at the plant of the Northern Malleable Iron Company, St. Paul, Minn., unloading pig iron from a railroad car and conveying it to a stock pile in the yard, consists of steel sections made in standard lengths of 4, 6 and 8 ft. and provided with instantaneous coupling devices, thus permitting a conveyor line of any desired distance to be assembled quickly, the commodities mentioned traveling over it by their own weight, on a 4 per cent. grade. The construction consists of a series of ball-bearing steel rollers assembled closely together in a rigidly braced steel frame. An important feature of the construction, which is covered by patents, consists of flanges at each end of the rollers, that are ½ in. larger in diameter than the rollers. These flanges revolve with the roller, and while preventing the material handled from crowding off the conveyor line, it is claimed that they produce no friction to retard progress. This method of conveyance, which eliminates the use of trucks, will, it is stated, cut the time and cost of handling from one-third to one-half, according to local conditions. A modification of this device is built for coreroom work.

Fig. 2 shows another of the company's gravity devices, which is known as the double roller gravity spiral. This device is applicable to the handling of many classes of commodities, packed in wood containers or barrels, since it provides a gentle means for conveying the products of factories, wholesale houses, warehouses, distilleries, breweries, etc., from upper floors to the shipping room or directly into the railroad cars on an industrial siding. As no operator is required, and loading can be done from all floors simultaneously, this device affords a very economical means of conveyance. Like the pig-iron conveyor, it is constructed of ball-bearing steel rollers, although in this case the rollers are assembled in a double row in a spiral formation supported by a strong steel framework. The spiral can be erected either inside or outside of buildings as may be desired.

A view of a portion of a conveying system which combines three of the company's devices is reproduced in Fig. 3. This system consists of a straight-lift automatic elevator in the left corner, which connects by a gravity conveyor line with an inclined automatic elevator shown at the right. This system is designed to handle shipping cases or boxed products of varying sizes between various points in factories, warehouses and other institutions automatically.

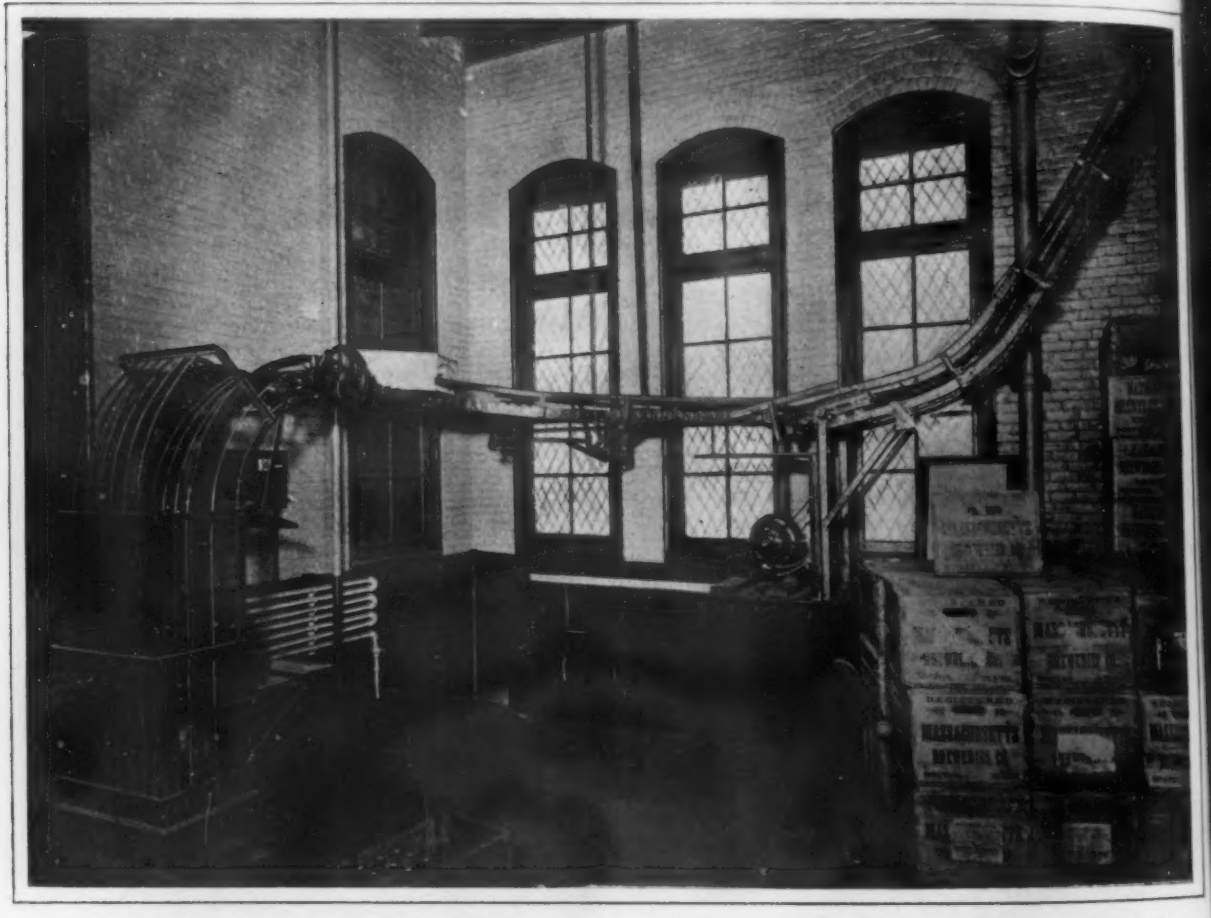


Fig. 3—View of a Portion of a Conveyor System Consisting of a Straight-Lift Automatic Elevator and an Inclined Automatic Elevator with a Gravity Conveyor Line Joining the Two

Water Tightness of the Panama Canal Gates

A high degree of water tightness has been obtained in the case of the gates for the locks of the Panama Canal, a remarkable fact when it is recalled that each of the leaves of the gates, which miter in pairs, is 65 ft. long and weighs 390 tons. The lower guard gates at the Gatun locks were closed on June 14, and when the full pressure of water, corresponding to a head of 42 ft., was developed, the mitering leaves were forced so closely together that the slight leakage occurring before the full water pressure occurred altogether ceased.

Some notes on the construction of these gates were given at length in *The Iron Age* of November 21, 1912, but no reference was made to the means taken to secure water tightness. In the Canal Record of August 6 is an account with sketches showing the adjustment to prevent leakage, and from these it appears that at the miter end of the gate the faces of the bearing plates were babbitted, as were also the plates at the juncture of each gate leaf with the lock wall, and that a strip of rubber 5 in. wide and ½ in. thick was attached to the timber cushion affixed to and extending across the bottom of each leaf, so that the rubber could prevent the escape of water between this wood cushion and the wooden timber fixed in the sill

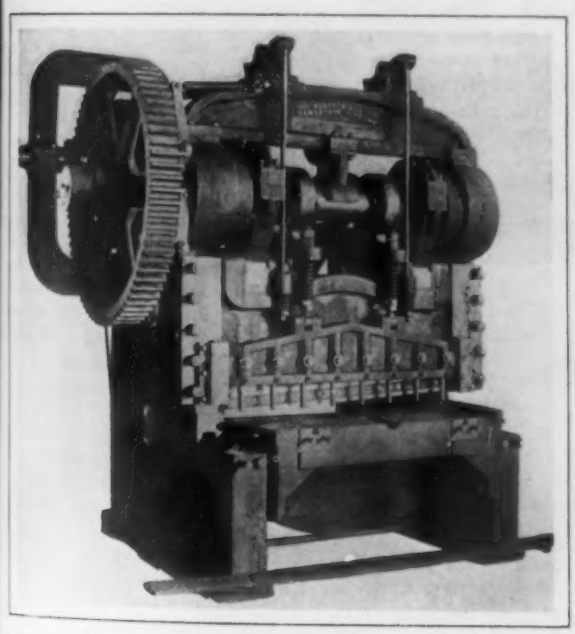
of the gates, even when for any reason the timbers themselves were not in absolute contact. The article mentioned is illuminating on the extreme care exercised in getting the gates accurately mounted and if is a favorable reflection also on the special machines for planing the ends of the horizontal girders of the gates. The McClintic-Marshall Construction Company had the contract for the fabrication and erection of this work and reference to these machines was made in *The Iron Age* of August 28, in the descriptive account of the Rankin plant of that company. The Canal Record says that, "The closeness of the joints between the two leaves of the mitering ends, and with the fixed castings at the hinge ends, is regarded as unprecedented in large scale steel construction."

A Heavy 5-Ft. Gate Shearing Machine

For shearing plates 1¼ in. thick and not over 5 ft. wide, Bertsch & Co., Cambridge City, Ind., have brought out a heavy duty machine of the gate type. As will be noticed from the engraving, the machine is of heavy construction. High grade steel forgings are used for the large shaft and ample bearing surfaces are provided. Machine cut gears are used throughout.

In addition to the table, the machine has two heavy crosstie pieces bolted to the two end housings. One of these is located overhead, and the other in the rear of the crosshead, an arrangement which it is emphasized greatly increases the rigidity of the machine. The clutch, which is automatic and positive in action and is said to be free from knocking, has steel jaws and a cast steel switch ring that acts against a hardened tool steel roller on the plunger.

The builder's patented holddown, which is arranged not to obstruct the shearing line, is used on the machine. The feet or guides of this fixture are easily and quickly disengaged either for removing the top blade or for operating



A Recent Design of 5-Ft. Gate Type Machine for Shearing 1¼-In. Plates

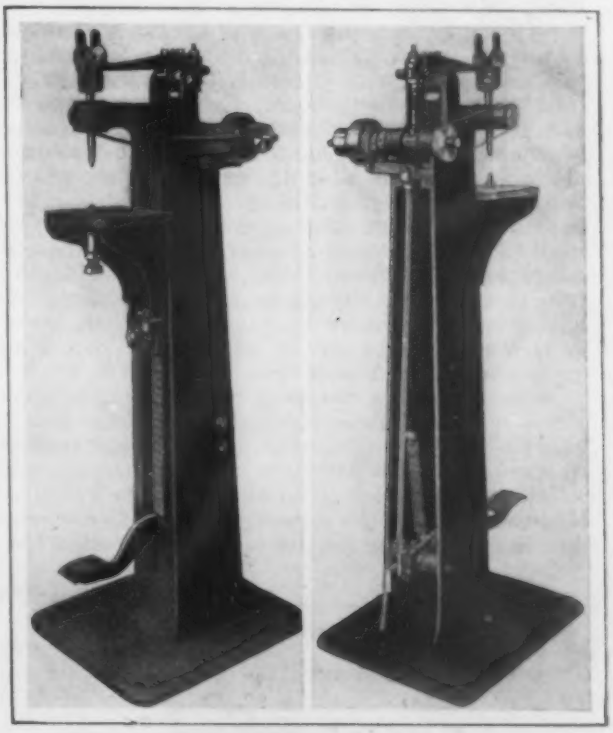
the shear without a holddown, if that arrangement is desired. In making these changes, it is not necessary to remove the entire holddown casting and connection.

The machine is driven by a direct-connected motor, which is mounted on a bracket bolted to the side face of the right housing. The power developed by the motor is transmitted to the machine through a set of gears.

On a bid of $3,500,000 the plant of the Michigan & Lake Superior Power Company, Sault Ste. Marie, Ont., passed into the possession of the first mortgage bondholders of the bankrupt company, represented by A. F. Weill. It is understood that the property is to be handed over to the Michigan Northern Power Company, a new corporation, which will repair and improve the plant. It was sold to satisfy holders of a first mortgage of $5,285,000.

New Rotary Vibrating Spindle Riveting Machine

The Grant Mfg. & Machine Company, Bridgeport, Conn., has recently added a new pedestal type of machine to its line of rotary vibrating riveting machines. It has a



Front and Rear Views of a New Pedestal Type of Rotary Vibrating Riveting Machine

capacity of ¼ in. and under, and is intended for operation in close quarters and other places which it is impossible to reach with the builder's regular rotating roll type.

The spindle of the machine is operated through an eccentric and vibrating hickory helve, a rubber ball being interposed between the later and the riveting spindle. Positive rotation of the spindle is secured by a worm and gear. The worm is driven by a belt connection from the main shaft, a round belt running over grooved pulleys being used. The diameters of these pulleys are slightly different, which makes it possible to interchange them when this is found desirable. In this way it is possible to vary the rotating speed of the vibrator, which, it is pointed out, gives the head of the rivet a smooth and fine appearance.

The machine is driven by a 1-in. belt, running from a pulley on the countershaft to a loose friction-driven pulley on the machine. Normally, this latter pulley runs idle and is brought into action through a friction disk by a ball thrust bearing. As soon as the pressure on the foot treadle is released the pulley runs idly on the shaft and a brake is automatically applied, which stops the machine almost instantly. A friction stopping device is also connected with the machine, which causes the vibrator spindle to stop at the highest point of its travel, thus permitting the work to be easily inserted and removed from the machine.

The following table gives the principal dimensions and specifications of the machine:

Distance from column to spindle, in.	5¼
Distance from top of table to end of spindle, in.	22
Dimensions of table, in.	8 x 8
Diameter of driving pulley, in.	4
Face width of driving pulley, in.	1
Speed of driving pulley, r.p.m.	1,500
Diameter of tight and loose pulleys, in.	6
Face width of tight and loose pulleys, in.	2
Diameter of countershaft driving pulley, in.	10
Over-all hight, in.	52
Floor space, in.	17 x 21
Weight of machine, exclusive of countershaft, lb.	300
Weight of countershaft, lb.	40
Boxed shipping weight, lb.	425

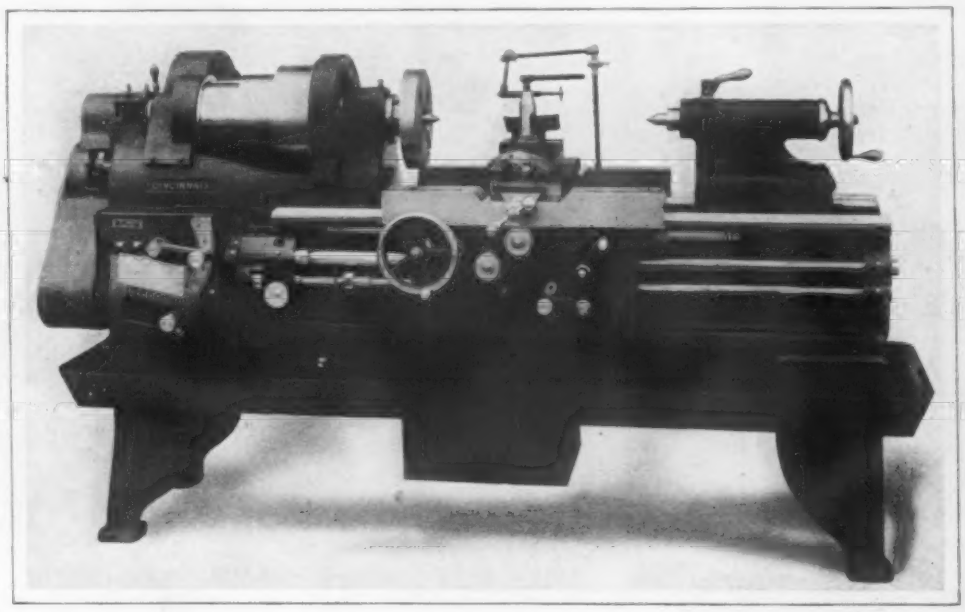
In addition to the machine illustrated a somewhat similar machine is built for use on a bench in which the largest rivet handled is ⅛ in. in diameter.

A Double Back Geared Toolroom Lathe

In addition to the quick-change gear engine lathe, which was illustrated in *The Iron Age*, May 1, 1913, the Cincinnati Lathe & Tool Company, Oakley, Cincinnati, Ohio, has placed on the market a new lathe intended primarily for toolroom use. In general construction, this lathe is the same as the earlier one with the exception that an oil pan and pump are supplied.

The headstock is of the double back geared type with three-step cone pulley, designed for a 3¼-in. belt. The back gear quill is made of steel and is bushed at both ends with bronze. A sleeve is mounted on this quill for shifting the gears, the motion being transmitted from the front of the machine. A double wall apron of the box type is bolted rigidly to the carriage, thus giving a double support to all the shafts and studs mounted in it. Motion is transmitted to the rack pinion which is made of steel and located close to the rack on the bed by compound gearing. The longitudinal and cross friction feeds can be started, stopped or reversed while the lathe is running, but cannot be engaged when cutting screws.

A thread chasing dial which forms a portion of the lathe's equipment allows the carriage to be run back by hand and the thread to be caught or picked up at any point without reversing the lathe, after the half nuts are opened. A reverse plate, which is mounted on the outside of the headstock is used for reversing the lead screw when threads are being cut, the feed reversing mechanism being



A Recently Designed Toolroom Lathe Equipped with a Three-Step Cone Pulley Double Back Geared Head

located in the apron. A quadrant at the end of the lathe enables extra or metric pitches to be combined with the regular U. S. standard lead screw, in addition to the ones provided in the gear box, by simply shifting two levers. These changes can be made while the lathe is running under a heavy cut, and in addition to cutting the pitch required, each gear will also cut others through the series of gear box changes.

The screw cutting and feed mechanism is assembled as a complete single unit in a box mounted on the front of the bed, and an index plate attached to the box enables the operator to see at a glance the correct positions of the two levers for any thread or feed. Another convenience of this arrangement is that the two levers are placed but a few inches apart.

An exhibit of safety devices for the prevention of accidents to employees is to be a feature of a meeting about October 21, 22 and 23 in Harrisburg, Pa., of the Engineers' Society of Pennsylvania. It appears that the Department of Labor and Industry of Pennsylvania is co-operating, and L. R. Palmer, chief Bureau of Inspection, Department of Labor and Industry, Harrisburg, is in charge.

Preparing an Enamel for Sheet Steel

Some interesting information on the enameling of sheet steel was recently contributed by Robert D. Landrum, to the Journal of Industrial and Engineering Chemistry. After dealing with the great amount of secretiveness which has surrounded this industry, not alone regarding the materials entering into the enameling compound, but also as regards the weights of the constituent parts, he outlines something of the preparation of the material. This part of the article is as follows:

The raw materials in due proportions are emptied on a maple floor and thoroughly mixed by shoveling. Elevators then take the materials up to bins, from which they are discharged in melts of about 1200 lb. into tank furnaces of the regenerative reverberatory type, which are best heated with gas (natural gas or producer gas) up to 1000 deg. (for glazes), or to 1300 deg. C. (for ground coats).

The hot melt is discharged into cold water; a violent reaction ensues, and the flux is broken up into small particles full of cracks; this quenching is to toughen the "enamel frit" and to facilitate the grinding, which takes place in large ball mills, with cylinders up to 6 ft. in diameter, lined with porcelain. By 30 hours' grinding the mixture of enamel, together with flints, clay, tin oxide, and half of its mass of water, is turned into a creamy fluid, which is allowed to age in tanks for a week or so. It then passes into the dipping-room into shallow troughs sunk into the tables, which are provided with slushers. The slusher takes the stamped sheets or utensils and coats them with the cream; the article is afterward placed bottom downward on three steel points to dry. When thoroughly dry the articles are passed into muffle furnaces, where the enamel fuses or coalesces at about 1000 deg. C.

Thus the first coat is prepared, which is frequently black, because oxides of nickel and cobalt are added to increase the adhesion to the steel. To apply a second and a third coating the article is returned to the dipping-room. The dried but not yet baked articles must be handled very carefully, lest some of the dry powder come off. Creams for mottled enamels are applied by means of atomizers. Waste materials from the floors and from the water-settling tanks are carefully collected and utilized in making cheap goods.

The steel on which the enamel is to be coated should, as nearly as possible, be free from carbon, silicon, sulphur, and phosphorus, and should not contain more than 0.2 per cent. of manganese. When the articles are stamped, a lubricant is used which can be easily wiped off, and heating is avoided; ears, handles, etc., are welded on rather than riveted, because riveted portions do not take the enamel well. The article is afterward well annealed at low-red heat, pickled in hot sulphuric acid, rinsed in water and weak alkali, and quickly dried. It is then ready for enameling.

The S. K. Elliott Electrical Company, the Motor Rental & Sales Company and the Ripple Engineering Company, Cleveland, Ohio, have been merged under the name of the Elliott Electrical Company, which will deal in electrical machinery and supplies and do electrical engineering and construction work. The company will be associated with the Miller-Seldon Electrical Company, an electrical jobbing concern of Detroit.

Motor-Driven Double Grinding Machine

The grinding of two parallel surfaces simultaneously by the use of individual motors is a feature of a new double-spindle direct-connected motor-driven disk grinding machine which has been recently designed and built by Charles H. Besly & Co., 118 North Clinton street, Chicago, Ill. In this machine, a type used by manufacturers of such articles as wrenches, two grinding disks, 18 in. in diameter, are brought in contact with the work. The head at the left is stationary, while that at the right can be moved along the bed by a rack and pinion and clamped to grind any desired length within the capacity of the machine.

When it is desired to bring the disks in contact with the work, the rotor shaft of the right hand motor, which is also the spindle for the grinding wheel, is moved 1 in. in an endwise direction. While grinding, the rotor is displaced ½ in. from the position of magnetic balance, but it is pointed out, that this displacement only reduces the motor efficiency from 1 to 2 per cent., while the maximum output remains approximately the same as when running in a balanced position. The longitudinal movement of this spindle is limited by an adjustable micrometer stop screw graduated to read to 0.001 in., so that work can be ground accurately to size and duplicated. The geared lever feed on the sliding spindle has a ratio of 20 to 1, which enables the operator to force the machine to the limit of its driving power without undue exertion. This lever is clamped to the pinion stud, an arrangement which makes it possible to clamp the lever on the stud in the position which is the most convenient for the workman.

The work rest, which has a vertical adjustment, is supported from a slotted pad on the front of the bed casting. Ten work rests in assorted widths from ¼ to 5-15/16 in. are regularly supplied with the machine. In the construction of the machine, provision is made for the attachment of a third wheel and rocker shaft to the left end of the machine at any time. A work table for serving this additional wheel can be mounted on the rocker shaft. An automatically telescoping dust hood forms a part of the equipment. This hood is hinged to the back to give free access for changing the disks, and there is an air-tight connection at the back of the machine for exhausting the grindings.

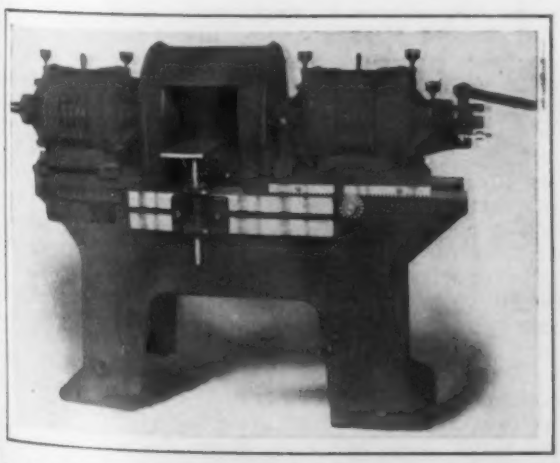
Hardened and ground tool steel thrust collars receive the end thrust of the spindles, and the end play is controlled by an adjustable steel collar, which is held in place on the outer bearing bushing by a lock nut at the end of the spindle. In the case of the right-hand motor, both bearing bushings slide with the spindle and completely incase it, thus reinforcing the spindle under load and protecting it against the entrance of emery dust. Compression oil cups supply the nectssary lubricant for the spindle and the thrust bearings, the oil being forced through grooves to the point where it is needed. These grooves are so cut that the movement of the lubricant is outward, which, it is pointed out, prevents grit from entering the bearings and cutting them.

This machine is driven by two of the new pressed steel frame type of motors recently developed by the Westinghouse Electric & Mfg. Company, and illustrated in *The Iron Age*, July 31, 1913. The motors are bolted on sub-plates which are mounted on ways planed on the main bed casting and are clamped in position in practically the same way as the head and tail stocks of a lathe. The rotors are built up directly on the grinding wheel spindles. These run in inserted phosphor bronze bearing bushings, which are inserted in special end castings provided on the motors. These machines are not built to operate on direct-current circuits, the motors being designed for either 25 or 60 cycle alternating current. The motors have a capacity of 5 hp., and, when used on 25-cycle circuits, run at a speed of 1400 r.p.m. For use on 60-cycle current, the machine is equipped with a wheel 20 in. in diameter, running at 1200 r.p.m., to get the proper cutting speed.

The following table gives the principal dimensions and specifications of the machine:

Diameter of spindle in bearings, in.	
Distance between floor and spindle center, in.	40
Maximum opening between wheels, in.	16
Floor space required, in.	24 x 58
Shipping weight, lb.	2,600

While the machine is built for belt drive, the builder does not recommend its use for the reason that a large and heavy countershaft is required, it being necessary to provide a drum pulley long enough to accommodate the full sliding adjustment in the movable head of the machine. The countershaft regularly furnished is 96 in. long and weighs over 700 lb.



An 18-In. Double-Spindle Grinding Machine with Individual Direct-Connected Motor Drive

Foundrymen's Convention Programme

The general committee in charge of arrangements for the convention of allied foundrymen's associations at Chicago in October is rapidly completing its plans and the preliminary announcement of the programme of convention sessions and entertainment has been made as follows:

Monday, October 13

Registration

Tuesday, October 14

Morning:
- Joint session of American Foundrymen's Association and American Institute of Metals
- Address of welcome by the Mayor
- Responses
- Reading of general papers

Afternoon:
- Firt professional session of American Foundrymen's Association.
- First professional session of American Institute of Metals.

Wednesday, October 15

Morning:
- Professional session, American Foundrymen's Association.
- Professional session, American Institute of Metals.
- Annual meeting, Associated Foundry Foremen.

Afternoon:
- Special Northwestern Elevated train to Bismarck Garden from North Water street terminal.

Thursday, October 16

Morning:
- Professional sessions

Afternoon:
- Professional sessions

Evening:
- Annual banquet at La Salle Hotel

The ladies' entertainment programme will include a luncheon at Marshall Field & Co.'s Wednesday noon and in the afternoon a matinée performance. On Thursday evening the ladies will be entertained at the theater.

Arrangements are being made with a large number of plants in and around Chicago so that members of the foundrymen's associations may secure passes at the convention headquarters to inspect these plants either individually or in groups. The Hotel La Salle, La Salle and Madison streets, is to be the general headquarters for the convention.

Secretary of Labor Wilson announces that the Baltimore & Ohio Railroad and the machinists in shops throughout its system have entered into an agreement for one year, beginning September 1, which is expected to eradicate the trouble between them which has existed since the strike of 1910. The agreement provides for a nine-hour workday, regulation of apprentices, minimum wage scale, increase in wages from 35 to 36c. an hour, and better sanitary and safety conditions for the men.

Death of Fred Harris Daniels

Chief Engineer of the American Steel & Wire Company—A Conspicuous Factor in the Wire Industry

Fred H. Daniels, the chief engineer and a director of the American Steel & Wire Company, and for years one of the most prominent figures in the country's wire industry, died at his home in Worcester, Mass., Sunday evening, August 31. He had been in poor health for a year, but during much of the time until a few weeks ago had kept in close touch with the duties of his office. He was 60 years of age.

Fred Harris Daniels was born at Hanover, N. H., June 16, 1853, the son of William Pomeroy and Hepsy Ann (Stark) Daniels. On both sides of his house he was descended from a long line of New England ancestors. When he was a year old his parents moved to Worcester, which was ever afterward his place of residence. He entered the Worcester Polytechnic Institute in his 16th year and graduated as a mechanical engineer in 1873. On leaving school he entered the employ of the Washburn & Moen Mfg. Company as a draftsman, being the first man employed in that capacity by the company. He was in the office of Charles H. Morgan, the general superintendent, with whom he was intimately associated until Mr. Morgan's retirement from the business.

FRED HARRIS DANIELS

In 1874 the company heard much complaint regarding the production of high grade wires, the principal cause of the trouble being the lack of uniformity in the chemical composition of steel billets and wire rods imported from Europe, and Mr. Daniels was sent to Lafayette College, Easton, Pa., to take a course under Dr. Thomas H. Drown, head of the chemistry department and one of the leading authorities on the chemistry of steel. On his return to Worcester Mr. Daniels was given the title of mechanical and chemical engineer and built and equipped a combined drafting room and chemical laboratory and was given charge of the department, holding this position for several years. In the summer of 1877 he went abroad with Mr. Morgan, the purpose of the trip being to familiarize themselves with the status of the industry in Europe. While in Sweden Mr. Morgan was so impressed with the manufacture of iron in the Lancashire hearth and the results accomplished in the open-hearth steel works and rod mills that it was decided to have Mr. Daniels remain in the plant of the Bofors Iron & Steel Works as a workman. The several months of this practical experience proved of great value to the Washburn & Moen Company, for the company was the largest maker of iron screw and rivet stock in the United States. Upon his return to Worcester Mr. Daniels made the necessary drawings for a large installation of Lancashire hearths and of open-hearth steel furnaces and rolling mills, and these were built under his direction.

In 1878 Mr. Morgan and Mr. Daniels again visited Europe, their special errand being to investigate a continuous mill which had been developed in Germany by a French inventor. The American engineers saw for the first time a continuous mill with all horizontal rolls. For a long time they had been considering the construction of such a mill and the invention of the Frenchman, though in itself nothing more than an experiment, demonstrated beyond a question the practicability of the principle. The problem which most troubled them was the devising of an automatic reel for coiling the rods, which had never been accomplished. One day on the return passage they were seated on deck. The ship had shortened sail and sailors were coiling ropes which had been piled on the deck. Mr. Daniels suggested that this was a practical way to coil hot wire and it was decided that the idea was wholly feasible by the substitution for the arm of the sailor of a rotating coiling pipe, with the finishing rolls to impel the rod forward into a stationary receptacle. Mr. Morgan immediately suggested a stationary pipe and a revolving receptacle with a vertical axis. This method has never been improved upon. The result of the journey was the mill with all horizontal rolls and the necessary reels. The tonnage was doubled and rods two sizes smaller than had ever been rolled were produced. The art of rod rolling was revolutionized.

Shortly after returning to Worcester Mr. Daniels was promoted to the office of superintendent of buildings of the Washburn & Moen Company, and he still retained charge of the drafting rooms and laboratories. When Mr. Morgan resigned from the company, P. W. Moen was made general superintendent and Mr. Daniels assistant superintendent. At this time it became imperative that either the Worcester works should be enlarged or a new plant constructed nearer the distributing center. Mr. Daniels was one of the committee which selected the site at Waukegan, Ill., and himself prepared the drawings and constructed the works at a cost of $2,500,000. Six months after ground was broken wire was being drawn and in nine months rods were being rolled. The rod mill was unique in that it had a double Belgian continuous finishing mill which produced a higher grade of wire rod. This and other inventions connected with the mill were patented by Mr. Daniels. After serving as assistant general superintendent for about a year he was promoted to general superintendent. In 1895 he was sent to San Francisco, where in conjunction with Frank L. Brown he established the California Wire Works.

When the Washburn & Moen Company was absorbed by the American Steel & Wire Company Mr. Daniels became chief engineer of the 30 plants, and on the resignation of P. W. Moen as manager of the Eastern district he was made a director. As chief engineer he was given the responsibility of putting a number of rather run-down properties in first class condition. The scope of this important work was comprehensive. John W. Gates was strongly desirous of prompt action, and Frank Baackes, the general superintendent, and Mr. Daniels were given practically carte blanche to place orders for blast furnaces, rolling mills, heating furnaces, wire producing apparatus, facilities for fabricating wire goods, boilers, engines and other equipment, subject to almost constant consultation with William P. Palmer, the general manager, who was shortly afterward promoted to the presidency of the company.

After the American Steel & Wire Company became the property of the United States Steel Corporation Mr. Daniels was appointed chairman of its board of engineers which has charge of the 143 plants, this responsibility being in addition to his duties as chief engineer and director of the subsidiary company. For the last six years he had

ed as president of the Washburn & Moen Company d of the Worcester Wire Company. In the latter part 1905 he was appointed by the United States Steel Cor- ration to serve on the Board of Consulting Engineers, nsisting besides of John Reis, chairman, G. G. Thorp d E. E. Slick. It was authorized to pass upon the final ans for the new plant of the Indiana Steel Company to located at Indiana Harbor, Ind., on the shores of Lake ichigan, known to-day as the Gary plant. He was a mber of the patent committee of the United States el Corporation and chairman of the industrial museum mmittee of the American Steel & Wire Company.

In 1902 and 1903 Mr. Daniels designed and constructed San Francisco the largest wire plant west of the Mississ- pi River, known as the Pacific Works of the American el & Wire Company. In 1907 he was delegated to go road to inform himself fully regarding rolling mills for oducing hot rolled flats, a mission in the interest of the merican Steel & Wire Company. Simultaneously, the ited States Steel Corporation authorized him to nego- te for the purchase of a shop right for its plants in the tented device of E. Theisen, of Munich, for purifying ast furnace gases. After an absence of three months returned with drawings of double duo mills for hot lled flats, and complete drawings of the Theisen installa- n, with a shop right for the entire Steel Corporation.

In 1907 and 1908 he designed and constructed for his mpany the Cuyahoga Works at Cleveland, Ohio, one of e largest hot and cold flat rolling mills in the United ates, which also had spring and bale tie drawing facili- es; and in 1910 and 1911 he designed the Birmingham Vorks of the American Steel & Wire Company of Ala- ma, which is one of the largest mills in the United ates.

Mr. Daniels's inventions began almost immediately upon s employment by the Washburn & Moen Company. hey relate principally to the manufacture of wire rods d wire, and especially to the continuous rolling of wire ds and their automatic coiling, but are not confined to is field of work, covering a wide range of usefulness. lany of them have proved very profitable to his company d have resulted in rapid advances in wire manufacture d in commercial practices. Many of his expired patents e now in use in Europe as well as in the United States. ltogether 151 patents were issued to him—129 in the nited States, 2 in Germany, 2 in Sweden, 15 in England, in France and 1 in Canada, and the major portion have roved of much value.

The value of his services was not confined to his inven- ons. He had strong executive ability, was a capable rganizer, with a keen business instinct, and his judgment to the value of the inventions of others was exceedingly od, in fact almost unerring. His counsel was always alued by those with whom he came in contact in business. e was one of the few men in the steel industry who uld speak with equal authority on its mechanical and etallurgical problems.

Mr. Daniels was a member of the American Society of echanical Engineers, of which he had been a vice-presi- nt; also a member of the American Institute of Mining ngineers, of the American Society for Testing Materials, f the Iron and Steel Institute (Great Britain) and of the merican Iron and Steel Institute, and a charter member f the American Society for Promoting Efficiency. He as a trustee of the Worcester Polytechnic Institute and e chairman of the shop committee, a most important ffice in a school where the mechanical engineering depart- nent is one of the most successful in the country. He ad important business interests outside of the American teel & Wire Company. He was a founder and a director f the Norton Company and the Norton Grinding Com- any, a director of the United States Envelope Company nd the American Granite Saw Company, all of Worcester; lso a director of the Mechanics' National Bank and a ember of the corporation and the board of management f the People's Savings Bank of that city. He was a irector of the Massachusetts Employees' Insurance Asso- iation, which is an important factor in the operation of he Workmen's Compensation Act of the State.

Mr. Daniels had membership in the Worcester Club, Tatnuck Country Club and the Quinsigamond Boat Club f his home city; in the Engineers' Club, Machinery Club nd New York Athletic Club, New York; the Duquesne Club, Pittsburgh; the Century Club, Cleveland, and the Muskegat Gun Club, Nantucket, Mass.

He leaves a widow and three sons. All of the latter are following the engineering profession.

A New Type of Factory Floor

A new form of factory floor, comprising briefly the use of 1/16-in. metal strips placed between narrow boards so that the metal portion of the floor is always taking the brunt of the wearing action of the wheels of factory trucks, has been brought out by the Stanley Works, New Britain, Conn. It appears that this general form of floor was laid down in the Stanley plant some two years ago, and it has been so successful that the company has decided to make it as a marketable commodity, and has for this purpose applied for patents. To assist in gaining an idea of the construction, the accompanying illustration has been prepared.

The metal portion of the flooring comprises strips of steel stock about 1/16 in. thick, bent for a length of 4 in., first to the right and then to the left and alternating as indicated, making a T section with the long member about 1 in. The metal is laid between wooden strips of the flooring, and the wood rests on the turned-over flanges of the metal. In the Stanley Works, the wood strips used are 2 in. wide and 1 in. thick, so that the top edge of the metal comes level with the surface of the floor. It is emphasized that the strips of wood are narrower than the width of the wheels of the trucks used in the factory, and it is preferable to have the wheels of the trucks a good deal wider than the strips of wood, so that the truck may always travel on the edge of the steel strips, as stated. The use of 1-in. wood stock instead of regular 1¼-in. flooring means, of

Metal Strips in Flooring of Stanley Works

course, a saving on this account, and the fact that the boards rest on the steel makes it unnecessary to use grooved floor strips. The floor as shown in the cut is laid directly on top of the heavy flooring timbers.

In many of the departments of the Stanley Works loads of 1500 to 2000 lb. are carried on the small trucks, and it is found that the trucks can be pulled much easier over this type of flooring than over the ordinary wooden flooring, especially after wear commences. As regards the wearing qualities, E. W. Pelton, superintendent of power of the Stanley Works, says that judging from the amount of wear shown up to date, the floor will last at least three times as long as an unprotected floor. The flooring itself is made up in lengths of 4 ft. to 8 ft. The metal portion weighs 26½ lb. per 100 ft. It should be added that for outside runways and loading platforms 2 x 4 in. oak has been used with the 2-in. edge up and the sides of the oak piece grooved 1 in. from the top to take the flange of the steel strip.

The Killen-Walsh Mfg. Company, Appleton, Wis., has just shipped a seven-ton 40-hp. caterpillar type tractor to Cuba and is advised by its New York representatives that several large foreign contracts are pending. The company is under contract to build 10 tractors a month for the first year and one a day for the next three years for the New York house.

Protecting the Eyesight of Workmen*

Goggles Which Meet the Objections to Those Now Available for Shop Use

——BY WINTHROP TALBOT, M.D.——

Eyes have been injured and eyesight lost in so many cases through the lack of proper safeguards, it seems strange that not more attention has been given the matter of properly protecting the eyes. The optician will say at once: "Look at this collection of goggles; here are scores of models." It is true that goggles galore are on the market; however, it does not necessarily follow that the subject has been given proper attention. By proper attention is meant giving study to the comfort and convenience of the worker who uses the device.

One often hears the comment: "We have provided goggles for the men, but they will not wear them"—a statement which implies a certain obstinacy and thick-headed determination on the part of the workman to expose himself wantonly to the danger of losing his sight. My sympathies are with the workmen, and if I were grinding or chipping steel, or were exposed to splashes of acids or hot metal, and had to wear a pair of goggles as uncomfortable and inconvenient as those which are ordinarily provided, I, too, would be likely to use the disparaging remarks passed by men who ordinarily wear them.

Objections to Common Forms of Protectors

Any mechanism or apparatus so constructed as to neglect the comfort and convenience of the human being destined to operate or wear it is unscientific. Let us busy ourselves at some one of these jobs endangering eyesight and try wearing some common form of eye protector. In the summer time we sweat and the perspiration clouds the glasses. In the winter cold weather makes them fog. The glasses are too narrow for broad foreheads or too wide for narrow foreheads. If the eyesight is not good and a man has to wear spectacles, he cannot wear spectacles and

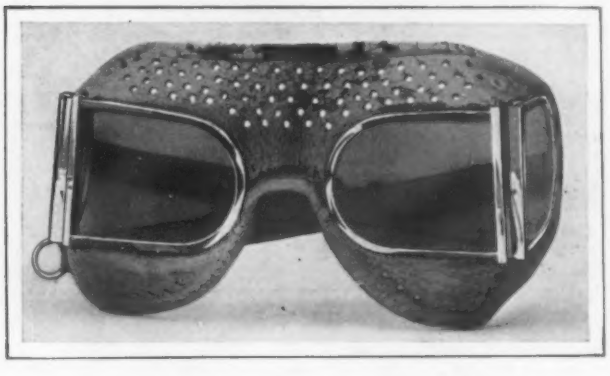


Fig. 1—Goggles Meeting Requirements of Shop Use

goggles too. The wires over the ears are irritating. When through with the goggles valuable time is consumed and care must be taken to put them away in the case. It is not stupidity that makes men loth to wear eye protectors; the fault is with the device itself.

Any effort to improve work conditions resolves itself into three steps—observation, analysis and construction. We must first see conditions as they exist, analyze the defects, and then use our experience and ingenuity to devise ways to remedy them. Applying these principles to conditions endangering vision, we find that eyesight is often injured by blows, by flying particles, by hot metal, and, lastly, splashes of acids or other liquids. Nature does most of all to protect the eye from violence by the bony prominences of the orbit, and the eyelid, lashes and tear gland help to protect the eye from dust; but to prevent foreign solid bodies or liquids from doing harm we must employ artificial means. These are either masks or protective glasses or screens. They are made in many forms for diverse purposes, but apparently are constructed without analyzing the conditions to be met, with regard to industrial needs, visual comfort or convenience in daily use. For this reason it has seemed best to try to arrive at certain definite conclusions and standardize if possible the characteristics of an eye protector which would be satisfactory to the workman.

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Essentials in Eye Protectors

1. Quality of glass.—The glass of an eye protector should be clear in quality, tough in texture, with a plane or flat surface, because convexity, streaks or other defects of the glass will harm the eyes which use it. If the glass can be easily splintered the danger will be rather increased than decreased. Convex surfaces cannot be made to parallel the convexity of the eye itself. This may be done with spectacles, but not with goggles under present industrial conditions.

2. Ventilation.—The goggle should be so arranged as to have ample ventilation behind it, or else the glass will cloud from the insensible perspiration of the eyes, cheeks and forehead. Clouding will also occur from changes in the humidity and temperature of the atmosphere. This, however, can be easily obviated by using an anti-sweat pencil which when rubbed on glass will keep it from clouding for six or eight hours.

Fig. 2—Goggles Folded to Be Put in the Pocket

3. Adjustment of size.—It is important in choosing an eye protector that it should be so shaped as to fit any face, because few industrial works can afford the skill, time and money needed to fit each employee and suit the individual anatomy of his eyes, therefore the goggle must be made of such form as to fit anyone. In the best form now on the market, eight different sizes are provided and must be kept on hand to meet individual needs. This is an expense and a nuisance.

4. Ease of adjustment and removal.—The goggle should be so arranged as to be adjusted easily and to slip up on the forehead with one motion of the hand quickly without thought. If goggles must be handled with care and time must be consumed in putting them on and taking them off, the workmen's tendency is not to wear them unless specially directed to do so by a foreman.

5. Lateral vision.—It is important under some circumstances that the eye protector should be so shaped that the workman can perceive objects coming from the side. Men are not horses and do not need blinders.

A Goggle Meeting Shop Requirements

The writer has sought in vain to find a goggle on the market which meets all these requirements. The accompanying model has a tough, thick, front lens with a metallized leather frame which can be brushed in soap and water to keep it clean. It also has side lenses which not only protect the eye, but also give side vision. It can be pushed up on the forehead, is amply ventilated and seems to be more comfortable to wear than any goggle on the market.

The front lenses are removable and may be replaced with blue or chlorophyll-tinted glass for men working in front of furnaces. When desired, the side lenses can be replaced by the insertion of pieces of asbestos board, with small perforations to protect the eye from heat and add to ventilation. The elastic bands are removable and may be quickly replaced by fresh bands at any time. The weight of the glasses does not rest upon the sensitive tissues at the root of the nose. What weight there is is sustained by the band encircling the head. In case of splashes from acids, alkalis or metals, not only the eye, but the lids and eyebrows, are protected from injury. One of the main advantages is the fact that spectacles can be worn with comfort behind the protectors.

These protectors are being tried out in various works at the present time. Because the number of accidents to eyesight has been increasing steadily, it is worth while for an industrial concern whose operations involve possible accident to vision to attend more carefully to the provision of eye screens or protectors which workmen can wear with comfort, and which do not impair vision or lessen production.

The Control of Fire-Pump Motors*

A Manual and Automatic Starter for the Slip-Ring Alternating-Current Motor

At the present time there seems to be some misunderstanding as to the control of alternating-current motors which drive pumps for fire protection. There also seems to be some question as to the type of motor to use. This is a vital subject and one which is consuming much thought at the present time by the National Board of Fire Underwriters.

There are two types of alternating current motors which lend themselves to fire pump work: the squirrel cage and the slip-ring type. It is generally conceded that the squirrel-cage motor is very adaptable to many installations due to the fact that it has not the complications of a slip-ring motor. The brushes on a slip-ring motor necessarily has arcing contacts. For fire pump service, however, where the motor and controller are always properly enclosed, the objections to the slip-ring motor are overcome and there are many reasons why this type of motor is better adapted to fire pump work.

From an engineering and from a safety viewpoint, the squirrel-cage motor is rather undesirable. The principal objections to this motor are its high-starting current and its low-starting torque. Combined with these features is the fact that it is impossible for an unskilled operator to accelerate a squirrel-cage motor without danger of taking a very high current from the line and the possibility of tripping the circuit breaker. In times of excitement when there is a fire and when the night watchman is liable to be called upon to start the fire pump, he will not wait sufficiently long on the starting tap for the motor to accelerate properly, but will be very much inclined to throw over quickly to the running position.

In acceleration, the slip-ring type of motor acts similarly to the shunt-wound direct-current motor, and while the results in starting are not equal to the compound-wound direct-current motor, the starting torque is sufficiently high to allow the motor to accelerate quickly and easily without taking a heavy current from the line, and therefore without danger of tripping the circuit breaker. The slip-ring motor is consequently better than the squirrel-cage for fire-pump duty.

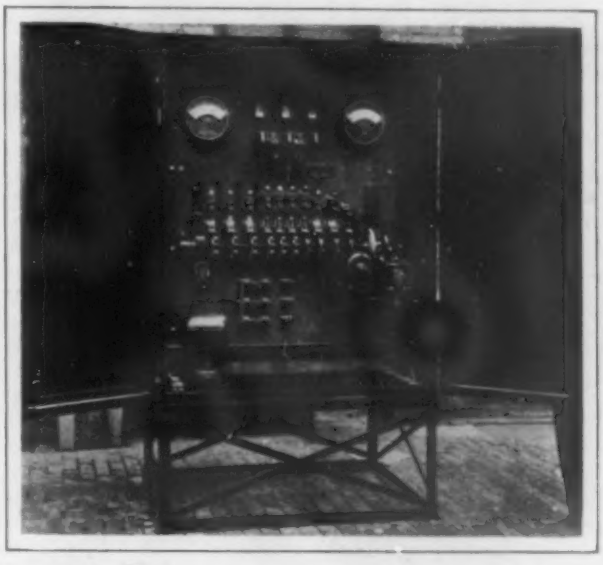
The controller for the fire-pump motor must be simple in design, easy to operate and reliable. The Cutler-Hammer Mfg. Company, Milwaukee, has recently put a new type motor-driven alternating-current fire-pump controller on the market. The one shown in the illustration is for a 100-hp 440-volt 3-phase 60-cycle slip-ring motor. Mounted on the control panel are a voltmeter, an ammeter, a three-pole rigid-arm plain overload circuit breaker, a three-pole double-throw knife switch, a pressure governor and a combined manual and automatic fire-pump motor starter. At the back of the panel in a suitable angle iron frame are mounted the cast-iron resistance grids which are used as the starting resistance in the secondary circuit of the motor. The whole controller is enclosed in a sheet-iron splash-proof case mounted on a pedestal 2 ft. high. The double-throw knife switch is for transferring the motor from one set of service lines to another, as connection to two separate power lines is often provided for reliability. The starter proper consists of a square shaft above which are mounted the three primary and the six secondary cam-operated switches. There is also an auxiliary cam-operated switch at the extreme right. The cam shaft, which actuates these switches is revolved for manual operation by a hand lever shown at the extreme left of the shaft.

Manual Operation of Starting Device Important

The manual operation is of primary importance, and it is only necessary for the operator (who may be an inexperienced night watchman) to pull the hand lever from the upper position through 180 deg. to the lower or full running position. The lever is held in the running position by an automatic coil. The movement of the lever above described first closes the three primary switches simultaneously and then closes the secondary resistance switches in proper succession, until the motor is brought up to full speed. The secondary switches are designed so that the resistance is cut out of each phase at the same time in equal portions and thus the motor is kept balanced during the starting period. On failure of voltage or at will of the operator the switches are all opened, the shaft being returned by a heavy clock spring.

Need for Automatic Control Also

If automatic control can be conveniently incorporated without complication of the hand operation, it gives a satisfactory method for maintaining a constant water pressure when a single sprinkler head opens or when a leak develops in the piping system. Furthermore the automatic operation provides a safety feature which



New Fire Pump Starter Designed for Both Manual and Automatic Operation

is not available in a straight hand starter. As in the hand operation the cam shaft is revolved to start the motor, but the operation in this case is taken care of automatically by a pilot motor mounted on a bracket below the right-hand portion of the shaft. This motor drives the shaft through a worm gear reduction box, the gears running in oil. A solenoid operated clutch is between the reduction gear box and the cam shaft. The automatic starting operation is as follows: When the pressure in the tank or stand pipe falls below a predetermined amount, due to opening of sprinkler heads, leaks, etc., the pressure governor closes the control circuit for a small two-pole magnetic switch located just above the cam shaft at the right-hand end. This switch closes and opens the pilot motor circuit. At the same time the governor closes the clutch solenoid circuit. The pilot motor revolves and a spring behind the movable jaw clutch member is compressed by the clutch solenoid. As soon as the jaws match, the spring causes the clutch to engage and the cam shaft is revolved. After the last secondary switch is closed the auxiliary cam switch opens and drops out the pilot motor switch, thus stopping the pilot motor and preventing further revolution of the cam shaft.

*From a private paper written by Harrison Pierce Reed, one of the engineers of the Cutler-Hammer Mfg. Company, Milwaukee, Wis.

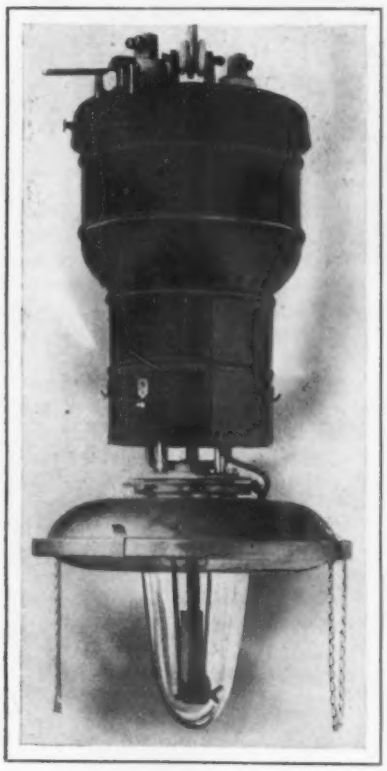
Removing Carbon Deposit by Oxygen.—Carbon deposit in the cylinders and valves of internal combustion engines has always been one of the great disadvantages of this class of motive power, and this is emphasized in the case of the automobile motor because of the frequency with which it is found necessary to take down cylinders and remove the valves. A way of removing this deposit has been found without the necessity of removing such parts. The device is known as the Dy-Karbo. The apparatus consists of a tank of oxygen with appliances of such a nature that all parts of the motor can be reached after opening a valve cap or sometimes only a spark plug. When the nozzle is inserted in the opening, the carbon is ignited by means of a taper as soon as the gas is turned on. The deposit is burned away from the metal very rapidly, and as soon as all the carbon is consumed the combustion automatically ceases since the gas has no effect after the cylinders and valves are clean. The metal parts, it is stated, are not affected, and only a few minutes are required to burn away all deposits even when very heavy.

S. DIESCHER & SONS,
Mechanical and Civil Engineers,
PITTSBURGH, PA.

A Flaming Arc Converting Attachment

An attachment for converting the ordinary inclosed arc lamp into a flaming arc has been developed by the Dyer Flaming Arc Company, 225 North Tenth street, Philadelphia, Pa. This attachment, to which the name of the Superior flaming arc attachment has been given, is understood to be capable of application to any type of inclosed arc lamp, regardless of the voltage, kind of current used or method of connection and will increase the candlepower without increasing the current consumption besides requiring no change in the mechanism of the lamp.

As will be noticed from the accompanying cut, the attachment consists of a condensing chamber mounted below the hood. The only thing removed from the old lamp is the globe and lower carbon holder, so that the gas check is exposed. The top plate of the attachment is then drilled to suit the screws and is fastened to the lamp. The body of the attachment is slipped into holes provided in the plate, and the negative wire is secured to the binding post on the attachment. When direct current is used the polarity is reversed, making the lower electrode the positive one. An ordinary carbon, such as is used for inclosed arcs, about 15 in. long, is employed for the upper electrode, while a short, thick one is used below. This is impregnated, yellow or whate flame salts being used.



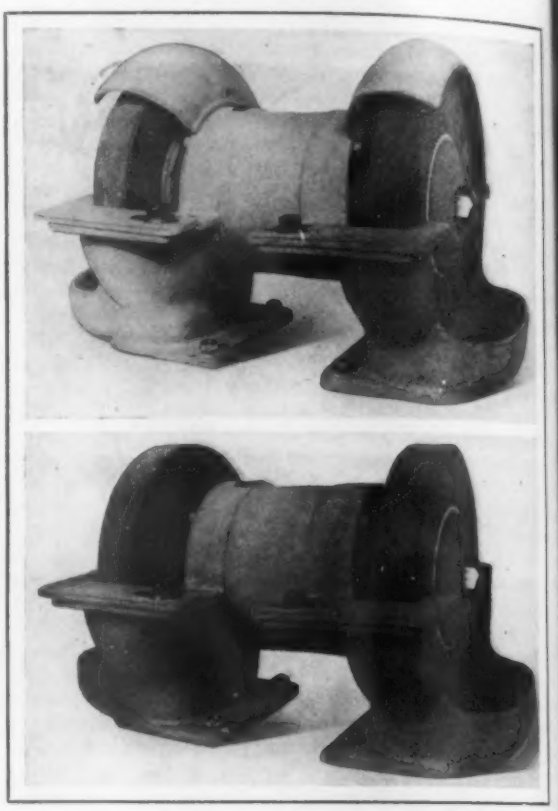
An Ordinary Inclosed Arc Lamp Equipped with a Recently Developed Attachment for Converting It into a Flaming Arc

The globe is held in place by a ring which is fastened to the body of the attachment by an arrangement of phosphor bronze springs, and in lowering the globe it is simply necessary to press these springs outward. The standard glassware equipment furnished is a clear inner globe, but an alba outer globe will be furnished where required. If the outer globe is used, it is pointed out that the brilliancy of the arc remains unimpaired throughout the trim, as the condensation of the fumes on the inner globe with a consequent reduced illumination is prevented. The inner globe is enlarged at the top to form the base of the large condensing chamber, and the arrangement is such that the fumes cool and deposit here, the chamber being easily wiped clean during the trimming operation.

The Nelson Foundry Company, North Milwaukee, Wis., has purchased C. J. Nelson's stock in the company. Mr. Nelson has organized the Nelson Company, Menomonee Falls, Wis., and that company is now building a concrete structure for foundry and machine shop purposes. The Nelson Foundry Company has sold to the Nelson Company its transmission line business, consisting principally of shafting hangers and boxes. The Nelson Company intends to specialize on the transmission line, while the Nelson Foundry Company will devote its energies to the gray-iron casting business. The Nelson Foundry Company will handle any cast-iron work in the jobbing line within its capacity, which is about 3000 lb., but it will specialize in snap floor and other light floor work for which its equipment is well suited.

A New Motor-Driven Bench Grinding Machine

Announcement was made in *The Iron Age* of June 19, 1913, in connection with a description of the 6-in. grinding machines built by Forbes & Myers, 172 Union street, Worcester, Mass., that a line of 12-in. machines was being developed. These have now been placed on the market and are made in either bench or stand types, the former being the one illustrated.



Two Views of a New 12-In. Grinding Machine Equipped with an Induction Motor and either with or without Wheel Guards

The motor used in these machines is of the squirrel cage induction type, and in starting the machine the motor is thrown directly on the line by the simple operation of closing a switch. The motor frame is extended, as shown, to form a water basin and support for the adjustable tool rest. The guard over the upper half of the wheels is made as a separate piece, so that it can be removed if desired, both types of machine being illustrated.

The rotating element of the machine consists of iron cast on a cold rolled steel shaft, with the wheels mounted at the ends. Copper wires are placed in grooves in the casting and terminate in cast copper end rings. Like the earlier machines, there is no paper insulation or any parts that might work loose in service.

Ball bearings of the heavy duty type are used, and are protected from dust and grit by covers which fit tightly around the shaft. Four grooves are provided in the covers, which are relied upon to prevent dirt from getting in close to the shaft. Wheels 12 in. in diameter, with a 2-in. face, are regularly supplied, but any type of wheel which does not exceed these dimensions can be used.

Newfoundland's Iron-Ore Output.—The iron-ore production of Newfoundland in 1912, according to an article by Consul James S. Benedict, St. Johns, published in the Daily Consular and Trade Reports, was 1,300,000 tons, which was an increase of 100,000 tons on the production of 1911. The exports for the fiscal year ended June 30, 1912, were 1,016,930 tons, of which the United States took 178,055 tons, Canada 646,395 tons, the United Kingdom 54,100 tons, Germany 38,330 tons and the Netherlands (undoubtedly for Germany) 104,050 tons. Mr. Benedict further states that the Nova Scotia Steel & Coal Company last year greatly improved its shipping plant at Wabana, Newfoundland, and its ore loading apparatus now has a capacity of more than 5000 tons per hour

The Production of Steel for Castings

Difficulties Not Involved in Ingot Steel—Carbon Additions—The Electric Furnace

At a meeting of the German Foundrymen's Association Berlin, Germany, a paper on "Steel for Steel Castings" s read by Th. Geilenkirchen, engineer, Remscheid. After ting that producing steel for castings presents difficulties involved in making ingot steel, he thus classifies the portant chemical and physical requisites of the former: Chemical factors: The presence of such elements in per amounts to insure certain desired physical prop-ies; the absence of such elements as phosphorus, sul-ur, copper and arsenic, which affect the properties of steel; the form and manner in which these various ements are united or dissolved in the iron; the freedom om dissolved or occluded gases; the freedom from idation; good deoxidation; the avoidance of segregation. Physical factors: The uniform distribution of the ements in the entire mass; the atomic concentration, or form and manner in which the smallest parts are ited to crystals or crystal groups; the size of the crystals d thereby the relation of the unfilled spaces.

The author remarks that a very fine crystalline state is hly desirable. He states, however, that steel which ording to the Thallner theory is made by a melting ocess in which the temperatures are increased gradu-y is superior to that made contrary to this rule, and thus desired fine crystalline condition is attained.

The question of the proper introduction of carbon into steel, whether in the elemental form or as a carbide, fully discussed. Mr. Geilenkirchen asserts that when rbon is introduced as a carbide, crystallization takes ace under essentially more favorable conditions than en chemical work is necessary to form the necessary rbide of iron, and that a decidedly better quality of el is produced. The properties of a charge of steel om an open-hearth furnace in which the desired carbon ntent was obtained by arresting the process at the proper nt differ from those produced by allowing the refining proceed to a low stage and then increasing the carbon adding coke, etc. In the latter case efforts should made so far as possible to introduce the carbon as rbide. Conditions are similar in the case of silicon, d other elements involved in steel production; also osphorus, sulphur, arsenic and copper occur not as ele-nts but as iron phosphide, iron sulphide, arsenic sulphide d copper sulphide, which often become located between ferrite and pearlite crystals. These disturb the powers cohesion between the crystals and consequently the operties of the steel.

The influence of inclosed gases or slag is similar. The rmer consist principally of hydrogen and nitrogen, while rbon monoxide occurs only in small amounts. The thor then refers to various methods of expelling the ases to show how it is possible beneficially to influence e elements, in the different processes of steel production.

Touching upon the economic phase, Mr. Geilenkirchen ates that the electric furnace under favorable conditions an produce steel equal to any crucible product. Using e electric furnace to produce steel castings, the question rises whether for certain grades a standard of quality is t established which cannot be met in the ordinary furnace d can command a higher price. For this the electric rnace is very advantageous, even though it cannot be cheaply operated as the open-hearth. On the other hand the question arises whether it is not possible to operate it as cheaply as the latter for ordinary grades, in which case there is no question about its superiority. The author figures a cost of 110 marks per ton of steel for a 3-ton Heroult furnace and 104 marks per ton for a 10-ton Heroult furnace. On May 1, 1913, it is stated, there were 42 Heroult furnaces in operation in the world and 20 in process of construction. Of the 42 in operation eight were devoted entirely to producing steel castings and five partly.

Touching on the production of malleable iron castings in the electric furnace, experience is cited to show that it is possible without any difficulty to pour regularly from the electric furnace castings of soft iron of a thickness of only 2 to 3 cm. These can be produced of better quality and usually cheaper than by the older process.

Large Castings for German Greyhounds

The ships of the Imperator class have steam turbines of unusual size with which to drive the four propeller shafts. The castings necessary for these turbines are noteworthy for their dimensions, and their production has made extraordinary demands on the practice of the German foundries. Two ships of the Imperator class are now being built on the docks of Blohm & Voss at Hamburg, Germany, one of which, the Fatherland, was recently launched. The largest castings for this ship, as described in the Zeitschrift des Vereines Deutscher Ingenieure for August 16, 1913, are those for the low pressure turbines. Fig. 1 shows the upper rear part of such a turbine casing. The largest inner diameter is 5584 mm, the largest bore 5120 mm, and the breadth and hight about 3000 mm, The weight is about 38 metric tons. In Fig. 2 is shown one portion of the casing of a high pressure reversing turbine, which is a rather complicated casting. For each of the ships referred to, there are 30 parts for the casings of seven of the turbines, made in gray iron. The casings for the eighth turbine are to be of cast steel. The total weight of the entire assemblage of castings for one ship is about 1000 tons. Ehrhardt & Sehmer, Saarbrücken, delivered the castings for the first ship in 12 months and for the second in 10 months.

Because of a lack of suitable cars to transport these castings, the delivery was at first delayed many weeks. A special car of 50 tons capacity was built for the purpose, having a hight of only 650 mm over the track level. It is shown in Fig. 1. There are two three-axle trucks of about 3 m wheelbase. The distance between the king bolts is 13 m. and the total wheel base 16 m. Since the trucks can move 90 deg. in either direction, the car can pass over very sharp curves.

The Forest Service of the United States Department of Agriculture states that, contrary to popular belief, forest fires seldom travel more than two or three miles an hour. Even in extreme cases it is questionable whether they burn at a rate of more than 6 to 10 miles an hour.

The Multiple Unit Electric Company, heretofore at 136 Liberty street, has changed its name to Electric Heating Apparatus Company, Multiple Unit department, and its address to 133 to 137 East Sixteenth street, New York.

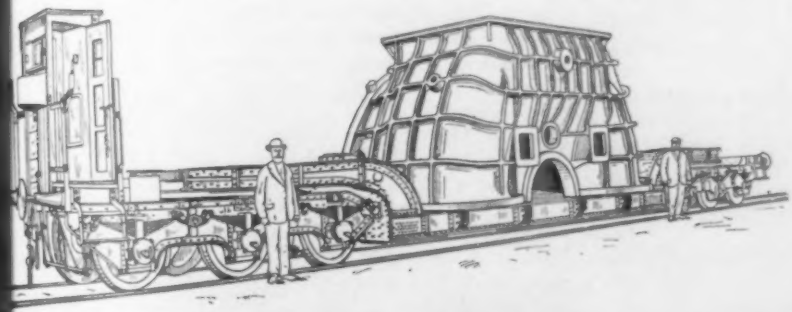


Fig. 1—Low Pressure Turbine Casing Showing Specially Constructed Car

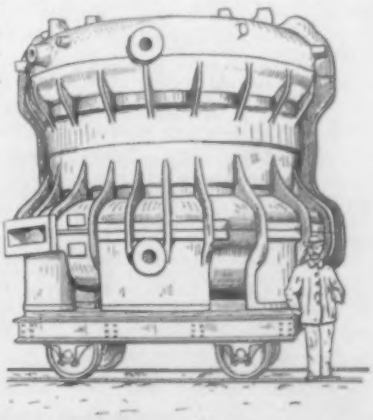


Fig. 2—High Pressure Reversing Turbine Casing

Marvelous Development of the Mesaba Range

Panama Excavation Far Outdone —Recent Years Bring Surprising Progress—A Mine Rescue Car

The Mesaba range is a swiftly changing panorama. A trip through this district is always interesting for the spectacle presented, for the physical evidences of tremendous ore bodies being mined by methods and at a rate unparalleled elsewhere. The changes since the meeting of the Lake Superior Mining Institute in Minnesota five years ago are especially pronounced because of the increasing proportion of the total tonnage being mined by open pit methods. The conversion into open pits of such mines as the Genoa, Shenango, Susquehanna and other deposits formerly operated entirely by underground methods is typical. In the same interval concentration of washable ores has also been brought through the experimental stage and the commercial concentrating mill at Coleraine, with capacity for treating 20,000 tons of ore daily, is a development of particular interest. A smaller plant is also in service at the Hawkins mine.

For the first time also it was possible to visit a steel plant and finishing mills within the confines of the ore-producing district. From the inspection of the steel plant built on his own threshold the man of the mines was able to gain a connected conception of the steel business as a process from ore to rails that has been impossible from visits to mills in strange and distant environment. In this respect the trip through the Minnesota Steel Company plant near Duluth had a unique educational value.

The Itinerary

The number of members making the trip varied at the several stages of the itinerary from 200 to 300. A considerable portion of the travel over the range was by automobile and the procession of more than 75 motor vehicles donated for the occasion was an interesting commentary upon the prosperity, excellent roads and co-operative spirit of the mining communities. To say that the itinerary was carried out to the letter of its schedule tells little of the exceptional arrangements provided for the convenience and entertainment of the visitors. It is only to be regretted that the Lake Superior Mining Institute has not brought the standard of its professional sessions up to the very high degree of excellence marking the handling of the inspection features. The following programme is largely self-explanatory:

Tuesday, August 26:
Headquarters at Spalding Hotel, Duluth.
Leave Fifth avenue dock by steamer *Columbia* for steel plant at 2 P. M., returning to Duluth between 6 and 7 P. M.
Leave Duluth by special train, via Duluth & Iron Range Railroad, from Union Depot at 12 o'clock midnight for Aurora.

Wednesday, August 27:
Breakfast on train at Aurora. Leave at 8 A. M. by automobile for the following mines: Biwabik, Corsica, Elba, Schley, Pettit, Genoa, Fayal, Adams and Spruce.
Luncheon at Globe Hotel, Eveleth, 12 o'clock.
Leave Eveleth 1:30 P. M. and visit the following mines: Norman, Union, Commodore, Lincoln, Alpena and Virginia & Rainy Lake Company's saw mill.
Base ball game at 4 P. M. at Virginia between Northern League teams.
Dinner at Elks' Club, Virginia, 6:30 P. M.
Business meeting, Virginia High School, 8 P. M.
Elks' Club and Virginia Club will be open in the afternoon and evening to all members of the Institute.

Thursday, August 28:
Breakfast on train at Virginia. Leave at 8 A. M. by automobile for following mines: Brunt, Mountain Iron, Wacoutah, Kinney, Whiteside, Woodbridge, Grant and Shenango.
Luncheon at 12 o'clock noon at Chisholm, in Bergeron Hall.
Leave Chisholm 1:30 P. M. and visit the following mines: Leonard and Monroe.
Arrive at Fair Grounds, Hibbing, 3:30 P. M. Attend horse races.
Dinner on train at 6:30 P. M.
Vaudeville entertainment, Armory, 8:30 P. M.
Algonquin and Oliver Clubs will be open in afternoon and evening to the Institute members.

Friday, August 29:
Breakfast on train at Hibbing. Leave at 8 A. M. for Hull-Rust, Burt-Pool, Sellers and Buffalo & Susquehanna mines.
Leave on Great Northern Railway at 10:30 A. M., visiting the following mines: Stevenson, St. Paul, Bray, Hawkins, Crosby, Hill, Holman and Canisteo, arriving at Coleraine between 5 and 6 P. M.
Luncheon and dinner on train.
Moving pictures of Mesaba Range mines, and business meeting, Village Hall, 8 P. M.

Saturday, August 30:
Breakfast on train at Coleraine.
Leave at 8 A. M. for inspection of concentrating and power plants.
Leave Coleraine, via Duluth, Missabe & Northern Railway, at 10:30 A. M. for Duluth.

Enterprise of Mining Towns

A record of the particularly impressive features of the Mesaba range would be incomplete without mention of the civic improvements that characterize the principal towns of the range. Virginia, which has been wiped out twice by fire, is now the fourth city of Minnesota in point of business. The public schools of the Mesaba mining towns have long been noted for their magnificence. To these buildings have been added libraries, court houses and municipal buildings beautiful in architecture and excellent in construction. On either side the main thoroughfares are lighted by large clusters surmounting ornamental columns spaced as frequently and with as brilliant lighting effects as characterize the metropolitan boulevards. Street pavement is of concrete and wood block. An electric interurban system connects the range towns from Eveleth to Hibbing. It is splendidly equipped and is earning good returns. Truly the past five years have brought an astonishing measure of civic improvement transforming the forbidding aspects of Mesaba glacial drift into creative comforts equaling those of any industrial city.

Panama Canal Excavation Much Exceeded

The trip to the mines covered a territory the general history of which is now a familiar subject. Of a total production of iron ore from the Lake Superior district up to January 1, 1913, of 574,125,258 tons, the mines in Minnesota contributed 312,782,340 tons and 279,067,325 tons came from the Mesaba range alone. To this last figure can be added an estimated production in 1913 of 37,134,000 tons, which compares with a production of 32,047,409 tons from the Mesaba in 1912. This enormous production, made possible by exposing the ore bodies by stripping the surface, has been preceded by the removal of 205,949,000 cu. yd. of sand, clay, boulders and taconite. Measuring the ore mined in cubic yards there has been moved by steam shovel on this range approximately 350,482,600 cu. yd. As against this figure there had been moved in the digging of the Panama Canal, according to last report, only 218,138,300 cu. yd. As indicating the increase in mining by stripping methods, mentioned above, there was handled in the eight years from 1892 to 1900 a total of 22,089,000 cu. yd., while in the twelve years from 1901 to 1913, one and one-half times as long, more than eight times as much stripping was moved, or 183,860,000 cu. yd.

Many New Mines Coming Forward

Since the last meeting of the Institute the Oliver Iron Mining Company has operated nine mines under the Great Northern ore properties lease, all new except the Leonard. The Arthur Iron Mining Company, in anticipation of the cancellation of that lease, is now preparing three new properties for shipping. One of these, the Dunwoody, was visited at Chisholm. The Oliver Iron Mining Company has also developed three or four smaller properties. Pickands, Mather & Co. have added to their operations the Kellogg, recently acquired from the receiver for the New York State Steel Company, and two others. Joseph Sellwood is mining from two new properties, the Shenango Furnace Company from one, Pittsburgh Iron Mining Company from one, A. B. Coates from two, Oglebay, Norton & Co. from one, the Inland Steel Company from one, the Cavour Mining Company from one, and the Morris Iron Company from one. In addition there are being developed several small independent properties from which no ore will be shipped in 1913.

Another contrast presented on the trip was the evidence of appreciation of future ore values—even on the Mesaba range—as compared with the prodigality of the past, which built roads of ore running 55 per cent. in iron and even higher. Frequent stock piles of lean ore now

appear where ore at present unsuitable for shipment is placed to be easily loaded by steam shovel at some later time. At the Monroe-Tener these stock piles have grown to such size that ore mined under the milling pit is being stocked back in the pit from under which it was taken by underground methods. At the Brunt mine a drying plant has been installed to improve the ore and at the Madrid mine near Virginia a small concentrating plant is installed. The concentrating plant at the Hawkins mine has been previously described in *The Iron Age* and a description of the mill at Coleraine was contained in the detailed publication of the paper by John Uno Sebenius in last week's issue.

Papers and Reports

The papers prepared for presentation at the meetings on Wednesday and Friday evenings included the following:

Report of Committee on the Practice for the Prevention of Accidents.
Sanitation for Mine Locations, by W. H. Moulton. Winona Stamp-Mill, by R. R. Seeber.
Mining Methods on the Mesaba Range, by Willard Bayliss, J. S. Lures, E. D. McNeil, committee.
What Our Neighbors Can Do in Mining Iron Ore, by Dwight E. Woodbridge.
Safety in the Mines of the Lake Superior Iron Ranges, by Edwin Higgins.
Relining No. 2 Hamilton Shaft with Reinforced Dividers, End Plates and Poured Concrete Walls, by S. W. Tarr, Duluth, Minn.
Suggestions on the Application of Efficiency Methods to Mining, by C. M. Leonard, Gwinn, Mich.
The Application of Mining Machines to Underground Mining on the Mesaba Range, by H. E. Martin and W. J. Kaiser.
Mine Laws, Special Rules and the Prevention of Accidents, by E. B. Wilson, Scranton, Pa.
Concentrating at the Madrid Mine, by Benedict Crowell, Cleveland, Ohio.
Wash Ores in Western Mesaba and the Coleraine Washing Plant, by John Uno Sebenius.

Unfortunately little or no discussion was developed. The collaborated report on "Mining Methods on the Mesaba Iron Range" covered the three general methods in use, namely, underground, open pit and milling pit mining. A table of comparative costs was presented, with a general statement of the conditions determining the method to be used. The description of the several methods and equipment was illustrated with accompanying sketches and views. Following the reading of the paper it was suggested that the report be made to include a statement showing the proportion of ore that is lost by the methods used, it being generally accepted that this loss is unusually small.

The paper by D. E. Woodbridge, which cited a number of examples of mining practice and costs in other fields, was particularly timely. As a result of the interest created consideration was at once given to the plan to go outside of the Lake Superior district for a meeting in the near future, the Birmingham, Ala., district being suggested.

First Mine Rescue Car

The United States Bureau of Mines has assigned to the Lake Superior iron ore fields the first mine rescue car to be stationed in a metalliferous mining district. This car, in charge of Edwin Higgins, made the trip with the Institute and was one of the interesting features. It is equipped with pulmotor breathing apparatus, first aid supplies and other necessaries in readiness for instant dispatching of the car to the scene of an accident. While the actual service required of the car is not considerable, the educational work conducted from it in the interests of safety is extensive. The paper presented by Mr. Higgins dealt with general problems of safety with which the Bureau of Mines is concerned. A. H. Fay, also of the Bureau of Mines, presented comparative figures showing the decrease in fatalities in Michigan and Minnesota iron mines coincident with the adoption of safety methods:

	Fatalities		Rate per 1000	
	1911	1912	1911	1912
Michigan	69	52	4.61	3.67
Minnesota	76	47*	4.59	2.94*

*Preliminary.

Machines in Iron Mining

The paper on "The Application of Mining Machines to Underground Mining on the Mesaba Range" was of particular interests as bearing upon a very recent development which is still in the experimental stages. The author made the point that progress in increasing the tonnage output per miner in underground work has fallen far behind the advances made in other directions. The data presented cover the work being done at the Harold mine at Hibbing. The machines installed are an ordinary Sullivan air pick or coal puncher and a Jeffrey air auger. The great advantage claimed for the machines, aside from increased output in a given time, lies in the fact that a much larger proportion of common labor for a given tonnage output may be employed. Similar machines are being worked at the Lake mine on the Marquette range with a decided reduction in the time required for bringing the ore down.

New Officers

The business matters of the Institute was completed with the election of officers for next year. The report of the nominating committee was as follows:

President—W. H. Johnston, Marquette range.

Vice-presidents—C. T. Kruse, Marquette range; Chas. E. Lawrence, Menominee range; Luther C. Brewer, Gogebic range.

Managers—W. A. Siebenthal, Marquette range; J. S. Lutes, Cuyuna range; S. R. Elliott, Marquette range.

Treasurer—E. W. Hopkins, Menominee range.

Secretary—A. J. Yungbluth, Marquette range.

The 1914 meeting will be held on the Marquette range.

The American Pulley Company Still Growing

The American Pulley Company, Philadelphia, Pa., maker of steel split pulleys, has enlarged its plant by the erection of another good-sized building. The remarkable growth of this concern shows how much can be done by proper methods. With the American Pulley Company, business has been more than the mere consideration of finding a market for a product; the establishing of this market (there are over 2,000,000 American pulleys in service) has been the natural outcome of strict adherence to a well-defined high standard. A business conducted on such principles could not fail to grow—and so this new building, containing 54,000 sq. ft. of floor space, or about 1¼ acres, became necessary. It will easily store 40,000 belt pulleys, but will also be devoted to the storage of sash pulleys, bushings and all finished products.

While American pulleys have always been quickly obtainable, due to the well-stocked branch houses of the company in Boston, New York and Chicago, and from over a thousand dealers advantageously located throughout the country, this great new storeroom will now make possible larger stocks being carried in Philadelphia of every size of pulley, from 6 to 60-in. diameters. Shipments to any point, domestic or foreign, will be greatly facilitated and more efficient service can be rendered to customers. The entire structure is thoroughly fireproof. It has brick walls, tile roof, concrete floors, metal racks, metal bins and shelving, and metal window frames. There is more floor space under this one roof than was occupied by the entire plant when established only 13 years ago. There will be a second story office, 80 x 100 ft. The office staff will move into its new quarters in October.

The United States Metal Products Company, College Point, Long Island, N. Y., and the Jamestown Art Metal Company, Jamestown, N. Y., have been taken over by the National Steel & Bronze Company, Boston, Mass., as a holding company. The United States Metal Products Company is capitalized at $8,000,000 and the Jamestown Art Metal Company at $2,000,000. The United States Metal Products Company was founded by John W. Rapp, who, while running a small sheet metal business at Sixty-sixth street and Third avenue, New York City, in 1886, conceived the idea of making metal doors, window sashes, etc., for fire-proof buildings. Mr. Rapp has for many years been president and general manager of the company and now retires from that connection, proposing to spend some time in traveling.

Howard F. Martin, formerly general manager of sales of the Pennsylvania Steel Company, and Frank B. Rutter, second vice-president and in charge of sales of the Scranton Bolt & Nut Company, lost their lives in the New Haven railroad wreck at Wallingford, Conn., September 2. Their wives were also among the dead.

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Here Is "Real" Competition

Our Washington letter on another page shows that in the course of events the time has again come for the Government to twist the tail of the armor plate lion. Again must manufacturers be shown the foolhardiness of engaging in a business in which the making of a profit depends on the caprice of a Cabinet officer, the mood of a Congress or the stress both may be under to produce political rousements. Incidentally the Navy Department has given the business world a new definition of "real" competition.

For one of the contracts the Navy Department let last week two responsible steel companies were competitors. One bid $5 a ton less than the other on the bulk of the material called for. The Secretary of the Navy decided that there was not "real" competition and called for new bids. The company whose bid at first was the high one became the low bidder in the second instance and received the award. The Navy Department in high glee announces the amount saved by the "trick" one of its officers had promised to show the manufacturers, and commends itself to the gratitude of the public for having at last established "real" competition in naval lettings.

There has never been any question about the standing in the business world of a firm or an individual who invites bids, makes them public and then uses the lowest one to club a still lower price from another bidder. Also there have been crises in affairs in which, whatever else was lost, some things to which men attach high values have been saved. But the Navy Department, whatever else has been lost in this demonstration of the capabilities of a highly ethical administration, finds satisfaction in having "saved" the Government a few dollars. It has also shown steel manufacturers and others what are the essential elements of "real" competition. As they turn it over in their minds they will find little difficulty in deciding to which class of buyers the present Navy Department has assigned itself.

Contracts for Steel Products

In the effort to unify and improve practice in the making of contracts for the sale of steel products much attention has been given to the form of the contract, as witness the action of the American Iron and Steel Institute in beginning several years ago an effort to formulate a uniform contract which might prove acceptable to the steel manufacturers generally. It is understood that the institute will discuss this subject at some length at the meeting in Chicago next month, when the contract committee will make a report.

Progress has lately been made toward clearer thinking upon this subject. When the discussion first began seriously the disposition was to charge most of the evils upon the form of the contract, but it is now being recognized that the practice in the trade is the vital factor. For conservative practice in selling a given form of contract may prove enforceable and entirely adequate, while the same contract, if used in loose and indiscriminate selling, is bound to result in trouble.

While this discussion has been going on in desultory fashion, the actual practices of the finished steel trade have improved at various points. In many instances the contract period has been curtailed, par-

ilarly by reducing the number of classes of buyers garded as legitimately entitled to relatively long rm contracts. The time was, not so many years o, that the jobber and the manufacturer of season- le goods were given contracts of equal length, but day it is recognized that an important distinction to be made. The aim is to reduce all contract riods as far as they can be reduced, and the chief casion for the making of a comparatively long time ntract is that the nature of the buyer's business re- ires it, through his being under the necessity of sell- g his own product ahead, and this particularly in so- lled "seasonable" goods. With the great majority steel sellers this distinction is now quite generally served.

The one step taken, there is obviously another one be considered, and that is for the buyer of steel oducts in his turn to curtail the period for which sells his product. This is desirable for the same asons that lead the steel manufacturer to curtail the riod of his sales contracts. Thus the steel com- nies can help to solve their own problem by en- uraging reforms on the part of many of their cus- mers.

The present market situation seems particularly favor the making of considerable progress in re- cing the contract period. In branches of the fin- ed steel trade there is more or less cutting. In se circumstances the buyer is far from anxious to ke forward contracts, while the seller, believing or least hoping that the price recessions may prove ly temporary, is disposed to avoid the making of rward contracts and direct his efforts to the sale material for early delivery. It is admitted that e desire of the seller to book his customer for all s requirements, estimated on a liberal basis, has ten laid the foundation for cancellation troubles d for failures to specify on a declining market. By garding the practice of the trade, rather than the rm of contract, as the element which needs chiefly be reformed, the proper mental attitude may be rmed for effecting measurable progress in the de- red direction in the next few months.

British Industrial Companies' Reports

The reports of British iron and steel companies hich are now appearing in London financial jour- als show the excellent condition of their business st year, compared with preceding years. The whole uropean iron trade enjoyed a period of unusual ctivity the past year. Germany, of course, with its eavy production, overshadowed other European coun- ries to some extent, and far less attention was paid the participation in the general prosperity by the anufacturers of Great Britain. British works which ad not yielded thoroughly satisfactory returns to eir owners in immediately preceding years did very ell, as shown by the reports now coming out.

Two British companies may be taken by way of lustration. One of these is the Workington Iron & teel Company, which is a combination formed four ears ago to take in quite a number of iron and steel roperties. Another is the great establishment of uest, Keen & Nettlefolds. The report of the Work- gton Company shows that in the past year a gross rofit was realized of £219,525 ($1,068,318), against 6,731 ($422,076) in the previous year, and £130,718 ($636,099) in 1910-11. The net profit was £131,945 ($642,070), against £56,731 ($276,081) in the previous year and £96,530 ($469,763) in 1910-11. The common stockholders were obliged to content themselves with no dividend last year, while this year they have been favored with 6 per cent. The gross profit of Guest, Keen & Nettlefolds in the past year was £453,093 ($2,204,977), against £395,586 ($1,925,119) in the previous year and £383,009 ($1,863,913) in 1910-11. The net profit was £383,391 ($1,865,772), against £325,884 ($1,585,914) in the previous year, and £313,307 ($1,523,249) in 1910-11. The holders of common stock received 15 per cent. dividends in each of these three years, but the amount set aside for reserves is now £120,000 ($583,980), against £70,000 ($340,655) the previous year. Other companies are showing returns of a similarly excellent character for the past year's business.

These results have been brought about by the very great increase in the demand for iron and steel throughout the world. Our columns have from time to time shown how the British iron and steel exports have increased, paralleling the increase in similar exports from Germany.

It is interesting to observe in the London Economist that the reports of the two British companies named above are not as complete as they should be for the information of the stockholders and of the general public. In the case of neither company is a detailed profit and loss account given. With regard to the report of Guest, Keen & Nettlefolds the Economist says: "It is to be regretted that the directors do not see fit to provide the shareholders with the requisite data for discovering exactly how the company stands." Evidently a campaign for publicity in corporation accounts is needed on the other side of the Atlantic.

Machine Tools and Accident Prevention

In general machinery builders have made a great advance in the safeguarding of their machines against accident to employees. A few have accomplished most excellent results. On the other hand some have progressed but little; their machines are hardly less dangerous than they were a decade ago, and are very far from the standard that is aimed at and that is easily possible. Certain users of this class of equipment have gone farther than most of the builders, and in some ways farther than practically all of them, in making machine shops safe places of employment, because they have guarded the approaches to moving parts wherever they cannot be adequately covered.

A machine usually stands in the open, for it can be approached from several directions. Its neighbors are close by, as a rule, and men pass and work between them. A misjudged distance, a slipping foot on an oily floor, a loose garment, the carelessness resulting from concentration on the work in hand—these and other similar possibilities may have serious consequences. Under rules laid down in some large works a machine should conform as closely as possible to the idea that even should a man try to fall into moving parts he would fail. Such perfect safeguarding is not always possible, but it may be approached. A man cannot be completely safeguarded against carelessness while he is in his operating position, but outside of this limitation a machine can be made practically free from danger.

The covering of gearing is the first step. And here is sometimes committed the error of relying upon a strip of steel covering only the face of the teeth; sometimes a wedge is formed between the two which constitutes a greater menace than leaving the gear uncovered. Guards should be channeled deep enough to make access to the teeth impossible. Belts are serious affairs. Many operatives, particularly women, because of their hair and clothing, have been terribly injured by them. Other moving parts should be studied with equal care with a view to protection. In one plant waist-high fences of pipe are employed to prevent access to dangerous parts. For example, the belt section of each planer is thus protected, preventing approach excepting when it is made deliberately and with a purpose.

The point has been made that machinery builders would find it worth while, and working a great good to study prevention of accident in the broadest possible manner in connection with the machines they produce, with the end in view of making each safe in itself and in the approaches to it. In rare cases only is much expense entailed in securing these results. Belt guards, railings and the like are cheaply applied. The works of enterprising customers afford advanced ideas on the subject. To rid any works of danger is highly profitable, both from a humanitarian and a commercial point of view.

Increased Output of Merchant Lake Ore

Will the Market Absorb It?—A Situation That May Lessen Somewhat the Advantages of Mine Ownership for a Time

BY O. J. ABELL

The disadvantage of those makers of pig iron and finished steel products who are without ore holdings of their own has had a prominent place in the trade comment of the past few years. This handicap has been generally considered an increasing one, notwithstanding that in all but the very prosperous years there has been offered for sale more non-Bessemer ore than the market would take. While the desirability of owning an ore supply, or of having connections equivalent to ownership is obvious, the developments of the past year in the ore fields of Minnesota promise to modify that advantage for a considerable period, at least when compared with the availability and possibly the cost of merchant ore.

In the Cuyuna district of Minnesota the original fields of exploration, known as the north and south ranges, are still almost entirely in the exploratory state. But in the middle territory between these ranges ore bodies of non-Bessemer grade have been found of such actual and prospective tonnage as to rank the Cuyuna range with any of the Lake Superior districts other than the Mesaba or Menominee. Shipments from this range during the current year will reach at least 750,000 tons, an amount that will be doubled in all probability next year. The owners of this newly developed ore include the Inland Steel Company and the Iroquois Iron Company, the Pittsburgh Steel Company, and Tod, Stambaugh & Co. The Cuyuna Mille Lacs Iron Company, an independent mining company, is also shipping. It is especially significant that of the above companies, three have limited ore holdings elsewhere and have been buyers of ore. The other two are sellers of ore. It is therefore apparent that the total tonnage of ore available for open market purchase will be increased by approximately the amount shipped from these properties.

Future Production from Great Northern Properties

In 1915 the Great Western Mining Company, subsidiary of the United States Steel Corporation, will turn back to the trustees of the Great Northern ore properties, mines from which the minimum shipments were expected to be 6,750,000 tons in that year. These mines include the North Uno, South Uno, Dale, Mississippi, North Star, Leonard, Harold, Mace and Fay. What arrangements will be made with regard to the Hill and Walker pits, in which the Steel Corporation has a half interest in its own right, is not yet determined. In the case of some of the above properties, shipments have depleted the ore bodies to such an extent that from these mines alone it would be impossible to move the above minimum tonnage. But the Arthur Iron Mining Company, the operating organization which has assumed the development of the Great Northern ore properties, is now opening up three new stripping properties from which ore can be shipped in 1914 and from which 1,500,000 to 2,000,000 tons of ore will be available for shipment in 1915. This output will offset the probable tapering off of shipments from the other mines. The new properties being opened up include the Dunwoody, adjoining the Monroe mine of the Oliver Iron Mining Company, the Dean near Buhl, and the Smith, a smaller property near Hibbing.

Following the notice of cancellation of the Great Western Mining Company lease, the properties included therein belonging entirely to the Longyear-Bennett-Pillsbury interests were returned to them by the Great Northern ore trustee, the only profit accruing to the Hill interest from these properties being the haul from mine to dock. The Longyear-Bennett-Pillsbury interests have now begun the active development of these deposits and are stripping the Bennett mine near Keewatin on the west end of the Mesaba range, a property capable of shipping 1,000,000 tons in 1915. They are also preparing to open up other mines in the near future.

Large Increase in Merchant Ore by 1915

Reckoning only that ore the mining of which appears to be definitely assured, there will be available for sale from the Great Northern and Longyear properties and including the ore displaced by the Cuyuna shipments, an aggregate of more than 9,000,000 tons in 1915. The effect of this upon the ore market is an interesting matter of conjecture.

The market that can absorb what might be termed the floating ore tonnage is comparatively limited. The total shipments from the Lake Superior District in 1913 will probably approximate 50,000,000 tons, but of this entire production about four-fifths moves through established avenues of consumption, either without change of ownership or subject to inter-relationships not likely to be overturned by changes in market prices. For those who buy ore on the open market, either outright or in exchange deals, to absorb a tonnage increase of 75 per cent. is naturally impossible.

The obvious conclusions are two. Either the produc-

on from the Great Northern ore properties will be cut own very materially from the rate at which the Steel orporation has been mining, or certain of the interests hich have their own ore will limit their mining operaons and become buyers of ore. There are two reasons hy the production from the Great Northern properties unlikely to be greatly reduced. The value of the Great orthern ore certificates is predicated upon a production rovided for under the Great Western Mining Company ase. The pressure from this direction will certainly be onsiderable. Much more tangible is the fact that three ew deposits are being opened up and plans for the near uture provide for the development of three additional ines. The piling up of the heavy charges involved in his preparatory work would be footless if there were no xpectation of shipping a commensurate tonnage of ore. A statement has been made by one of the owners of ore ands included in the Great Northern properties that this re has already been sold. Whether this is entirely corect does not affect the fact that the operating policy oints unmistakably to that expectation.

Outlets for the Increased Production

The interesting question is, Who will buy this additional ore? Most of the ore operators who are working their own mines may be eliminated for the reason that a large part of their business is the making of a profit from the sale of their ore. To the large independent steel companies, some of which have smaller ore reserves than they would like, the Great Northern ore undoubtedly gives renewed assurance, and an arrangement with one of these companies for taking this ore would be far from unlikely. But while their buying would produce a shift in the market, it would not reduce materially the total tonnage to be absorbed.

There remains the probability that the United States Steel Corporation will become an important buyer of ore. In the first place it is unquestionably desirable from the Steel Corporation's standpoint that the price of ore shall be fairly high rather than low, and the market steady rather than variable. The approaching situation will enable the corporation to serve as a balance wheel. In the field the practice of the Oliver Iron Mining Company has emphasized a concentration of operations on its properties held under short-term leases, and the conservation of ore held under low minimum leases or in fee. The wisdom of this policy needs no explanation. Conspicuous examples are the Stephens and Mountain Iron mines, the former held on an easy lease and the latter owned in fee. Both these mines have been idle for several years and are likely to remain so indefinitely. With this policy the purchase of ore would be entirely consistent.

Turning Leased Properties into Fee Mines

The same policy is further emphasized by instances where leased properties have been converted into fee properties for the purpose of controlling them so that they might be held idle. In many leases it is provided that the operating companies shall not only pay each year royalties on the minimum shipments, but shall also ship all the ore that can be mined profitably. The holding of leased mines idle has limited the annual returns to the fee owners to the minimum royalties. Where dissatisfaction with this condition has arisen, it has been proposed to the fee owners and in a number of instances accepted, that the Oliver Iron Mining Company take over the property, paying for it in notes maturing annually through a period of years equivalent to the life of the mine if operated, and bearing interest at 4 per cent. It has only required the reaching of an agreement as to the amount of the yearly notes to be substituted for the royalties to make it possible in this way for the mining company to control the property and also satisfy the previous owners.

Incidental advantages in the buying of ore by the Steel Corporation, as compared with its present arrangement of schedules, include a reduction of the 80-cent mine-to-dock charge under the Hill lease to 60 cents, or a saving of 20 cents per ton, plus whatever profit may accrue from the shipment of purchased ore over its own roads. The tax on ore reserves in the ground is also considerably less than the rate on ore shipped, the difference being equal to a charge of from 10 to 15 cents per ton. In addition to the above considerations, it can hardly be doubted that the general position of the Steel Corporation with regard to criticism of its ore holdings would be improved were it a buyer of ore instead of maintaining its present self-contained status.

The Embreeville Iron Company's Rehabilitation

It is stated that, following the chance discovery of zinc ore on the property of the Embreeville Iron Company, Embreeville, Tenn., the receiver will be able to pay the indebtedness and it is planned to rehabilitate the company. For 70 years the property was worked for the production of pig iron and four years ago it went into receivership. A statement issued by the Tennessee Geological Survey says of the zinc development:

"In mining the iron, work has been conducted on a rather large scale, immense quantities of clay containing iron having been removed by the hydraulic process. As the mine was worked for iron, it seems never to have occurred to any one that it might contain other ore. While in this condition C. A. Morris, who had been connected with the zinc mines at Bertha, Va., was sent to the property to look after it. Last December, Mr. Morris began to suspect that the mine contained zinc ore, and upon investigation concluded that such ore occurred there in good quantity.

"The property was to have been sold by the receiver last spring, but after the zinc was discovered authority was secured from the court to ship a carload of the ore as a test. This brought nearly $1000. Authority was then granted the receiver to ship 100 carloads.

"The ore thus far recovered has been shipped without milling. Most of the zinc ore is of the kind known as calamine. It does not occur all through the clay, like the iron ore, but hugs rather closely about the limestone 'pinnacles' that stand up in the clay and remain as conspicuous feature of the desolate pits from which the clay has been removed for the iron ore. The favorite place for the occurence of the zinc is in the pockets or saddles between the limestone pinnacles."

Quite unexpectedly, after an apparently irrevocable break, the miners, operators and smelters of southeastern Missouri reached an agreement August 26 and the men on strike returned to work. The agreement reached provides for an increase in wages amounting to 25c. per day for all classes of labor. A tabulated statement of the wage scale of each company affected is to be filed with the Missouri State Board of Arbitration, and also in all company offices, this scale to remain in force one year. All employees are to be reinstated as rapidly as conditions permit and there is to be no discrimination against any of them. All disagreements during the year of the agreement are to be referred to the State Board of Arbitration for settlement. It will be some time before all the mines in the district will be in full operation, as they had to a large extent filled with water and will have to be pumped out.

The main machine shop, wrecking equipment department and power plant of the Henry A. Hilner's Sons Company, Aramingo avenue and Huntingdon street, Philadelphia, Pa., were practically destroyed by fire August 28. The damage will probably reach $100,000, fully covered by insurance. The plate-washer and structural material departments were uninjured and continue in operation. The plant will be rebuilt.

The Chester Dairy Supply Company has taken over the entire plant of the Root Dairy Supply Company and has moved the business to Chester, Pa., at the corner of Sixth and New Market streets.

Pig Iron Output Less

August Daily Average, 82,121 Tons

Two Large New Furnaces Blown in in the Pittsburgh District

Earlier than in any other month, considering the holiday of Monday, we are able through the cooperation of the blast furnace companies to give in this issue our pig iron statistics for August. The production of coke and anthracite iron last month was 2,545,763 tons, or 82,121 tons a day, against 2,560,646 tons, or 82,601 tons a day in July. The total falling off is thus about 15,000 tons, or 480 tons a day. There was a net loss of six furnaces last month, 260 furnaces being in blast on September 1, as against 266 furnaces on August 1. The active capacity September 1 was 82,426 tons a day, against 81,657 tons a day August 1, the increase being due to better performance of a good many furnaces in August and the fact that the size of those blowing in averaged considerably more than that of the larger number of furnaces blowing out.

A notable addition to the country's pig iron production is made by the blowing in last month of the two large new furnaces of the Pittsburgh Steel Company at Monessen, Pa.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from August, 1912, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons.

	Steel Works.	Merchant.	Total.
August, 1912	59,464	21,582	81,046
September	59,102	23,026	82,128
October	62,820	23,952	86,772
November	62,817	24,878	87,695
December	63,770	25,996	89,766
January, 1913	63,921	26,251	90,172
February	64,005	28,364	92,369
March	61,448	27,699	89,147
April	64,658	27,101	91,759
May	64,232	26,807	91,039
June	62,002	25,617	87,619
July	59,362	23,239	82,601
August	59,140	22,981	82,121

Output by Districts

The accompanying table gives the production of coke and anthracite furnaces in August and the fo months preceding:

Monthly Pig-Iron Production—Gross Tons.

	Apr. (30 days)	May (31 days)	June (30 days)	July (31 days)	Au (31 da
New York	189,818	193,112	186,818	174,050	178
New Jersey	10,154	10,906	10,996	10,922	11
Lehigh Valley	100,141	97,591	86,818	79,942	80
Schuylkill Valley	78,225	78,745	77,428	76,400	58
Lower Susquehanna and Lebanon Val.	68,682	64,548	52,500	51,353	53
Pittsburgh district	648,223	613,258	562,249	539,275	571
Shenango Valley	136,685	144,746	140,184	145,834	136
Western Pennsylv'a.	167,251	167,197	147,397	139,787	143
Maryland, Virginia and Kentucky	57,885	60,502	64,066	60,187	56
Wheeling district	119,251	128,618	122,584	120,160	117
Mahoning Valley	248,425	273,666	250,061	257,092	264
Central and Northern Ohio	209,531	252,542	241,003	230,203	239
Hocking Valley, Hanging Rock and S. W. Ohio	31,490	41,291	38,271	33,273	34
Chicago district	388,061	405,605	389,949	372,754	356
Mich., Minn., Mo., Wis., Col., Wash.	83,773	78,493	71,407	68,966	68
Alabama	181,256	179,948	163,525	160,564	164
Tennessee	33,910	31,449	23,309	19,684	13
Total	2,752,761	2,822,217	2,628,565	2,560,646	2,545

Production of Steel Companies

Returns from all furnaces of the United States Ste Corporation and the various independent steel companie show the following totals of product month by mont Only steel-making iron is included in these figures, to gether with ferromanganese, spiegeleisen and ferrosilico These last, while stated separately, are also included the columns of "total production."

Production of Steel Companies—Gross Tons.

	Pig. Total production			Spiegeleisen and ferromanganese		
	1911.	1912.	1913.	1911.	1912.	191
January	1,128,448	1,483,153	1,981,560	8,360	22,622	15,63
February	1,185,782	1,550,995	1,792,154	12,821	15,950	20,13
March	1,518,063	1,827,792	1,904,878	11,784	11,538	20,54
April	1,434,142	1,830,717	1,939,751	10,657	11,104	23,10
May	1,310,378	1,922,557	1,991,192	13,641	20,518	19,80
June	1,281,241	1,823,958	1,860,070	22,611	26,685	19,23
July	1,316,646	1,803,205	1,840,216	17,067	26,522	22,31
August	1,460,610	1,843,404	1,833,352	14,579	24,225	20,68
September	1,490,898	1,773,073	.....	17,757	22,484	....
October	1,560,884	1,947,426	.....	19,697	27,252	....
November	1,452,907	1,884,524	.....	19,678	17,461	....
December	1,453,446	1,976,870	.....	20,068	18,523	....

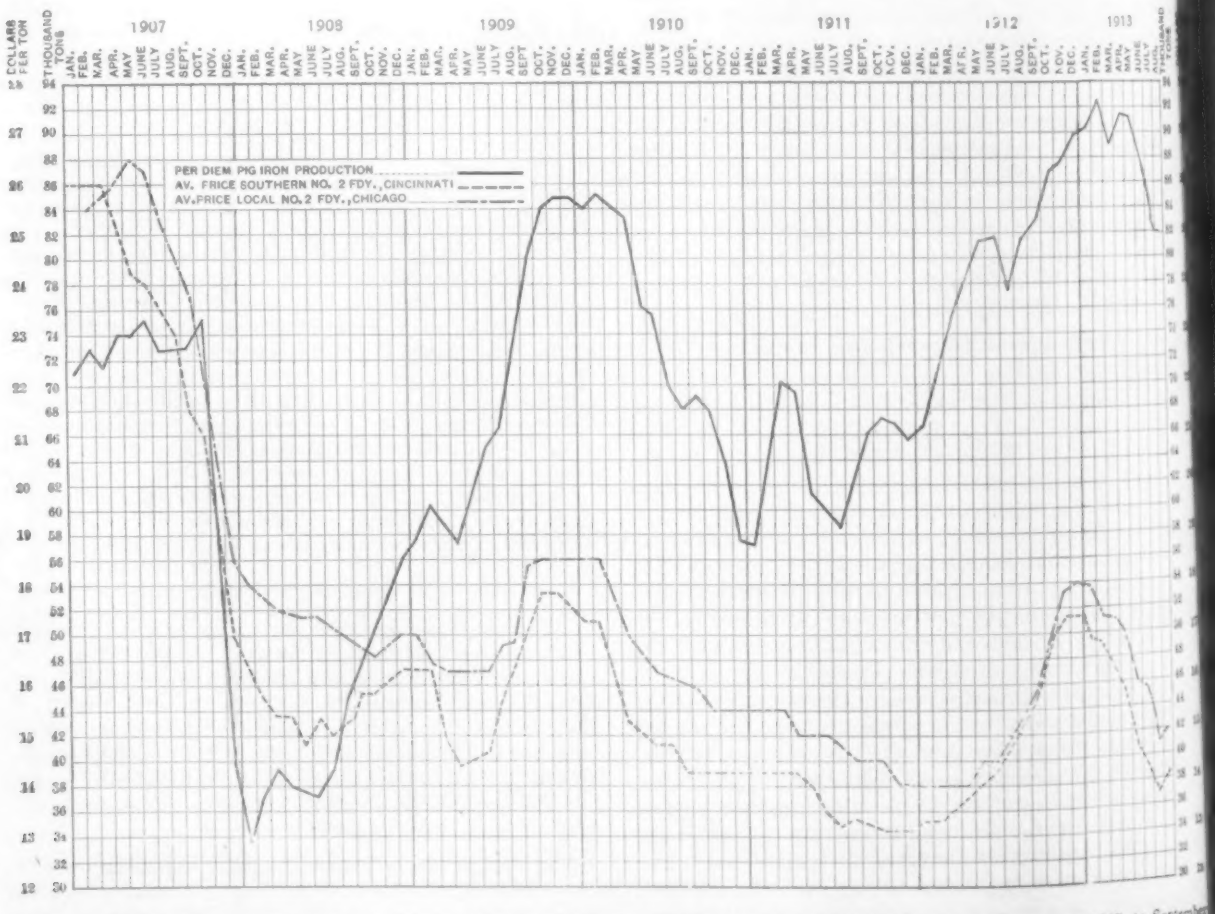

Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to September 1, 1913; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Capacity in Blast September 1 and August 1

The following table shows the daily capacity, in gross tons, of furnaces in blast September 1 and August 1 by districts:

Coke and Anthracite Furnaces in Blast.

Location of Furnaces.	Total number of stacks.	Sept. 1 Number in blast.	Sept. 1 Capacity per day.	Aug. 1 Number in blast.	Aug. 1 Capacity per day.
New York:					
Buffalo	19	16	5,468	16	5,623
Other New York	7	2	305	2	317
New Jersey	7	2	355	2	352
Pennsylvania:					
Lehigh Valley	22	10	2,494	11	2,510
Spiegel	2	1	77	1	79
Schuylkill Valley	16	7	1,805	10	2,495
Lower Susquehanna	7	5	1,070	5	1,043
Lebanon Valley	10	4	640	4	620
Pittsburgh District	53	45	18,642	42	17,255
Spiegel	3	2	327	3	487
Shenango Valley	19	14	4,470	14	4,145
Western Pennsylvania	27	16	4,728	15	4,430
Maryland	4	3	723	3	854
Wheeling District	14	11	3,793	11	3,876
Ohio:					
Mahoning Valley	24	24	8,923	23	8,510
Central and Northern	24	21	7,617	22	7,626
Hocking Val., Hanging Rock, & S. W. Ohio	15	9	1,077	10	1,125
Illinois and Indiana	34	26	11,030	27	11,277
Spiegel	2	1	124	1	131
Mich., Wis. and Minn.	10	6	1,215	6	1,095
Colorado, Mo. & Wash.	8	3	903	3	936
The South:					
Virginia	24	6	720	7	847
Kentucky	5	2	292	3	341
Alabama	46	21	5,233	21	5,179
Tennessee	20	3	435	4	504
Total	422	260	82,426	266	81,657

The average output of furnaces blown out in the month was smaller than that of furnaces blown in. Among those blown out were Hellertown in the Lehigh Valley, Topton, one Swede and one Warwick in the Schuylkill Valley, one Cambria in western Pennsylvania, Hall in the Shenango Valley, Low Moor in Virginia, Steelton in Ohio, Lawrence in the Hanging Rock district, one South Chicago in Illinois and one Bay View in Wisconsin.

Furnaces blown in in August include one Eliza and two Monessen (new) in the Pittsburgh district, New Castle No. 2 in the Shenango Valley, Colonial and Perry in western Pennsylvania, one Ohio in the Mahoning Valley, one Zug Island at Detroit.

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The figures for daily average production are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907.	1908.	1909.	1910.	1911.	1912.	1913.
January	71,149	33,918	57,975	84,148	56,752	66,384	90,172
February	73,038	37,163	60,976	85,616	64,090	72,442	92,369
March	71,821	39,619	59,232	84,459	70,036	77,591	89,147
April	73,885	38,289	57,962	82,792	68,836	79,181	91,759
May	74,048	37,603	60,753	77,102	61,079	81,051	91,039
June	74,486	36,444	64,656	75,516	59,585	81,358	87,619
July	72,763	39,287	67,793	69,305	57,841	77,738	82,601
August	72,594	42,851	72,546	67,963	62,150	81,046	82,057
September	72,783	47,300	79,507	68,476	65,903	82,128	.....
October	75,386	50,554	83,856	67,520	67,811	86,722	.....
November	60,937	51,595	84,917	63,659	66,648	87,697	.....
December	39,815	56,158	85,022	57,349	65,912	89,766	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1908—Gross Tons.

	1908.	1909.	1910.	1911.	1912.	1913.
Jan.	1,045,250	1,797,560	2,608,605	1,759,326	2,057,911	2,795,331
Feb.	1,077,740	1,707,340	2,397,254	1,794,509	2,100,815	2,586,337
Mar.	1,228,204	1,832,194	2,617,949	2,171,111	2,405,318	2,763,563
Apr.	1,149,602	1,738,877	2,483,763	2,064,086	2,375,436	2,752,761
May	1,165,688	1,883,330	2,390,180	1,893,456	2,512,582	2,822,217
June	1,092,131	1,930,866	2,265,478	1,787,566	2,440,745	2,628,565
July	1,218,129	2,105,431	2,148,442	1,793,068	2,410,889	2,560,646
Aug.	1,359,831	2,248,930	2,106,847	1,926,637	2,512,431	2,543,763
Sept.	1,418,998	2,385,206	2,056,275	1,997,102	2,463,839	.....
Oct.	1,567,198	2,599,541	2,093,121	2,102,147	2,689,933	.....
Nov.	1,577,854	2,547,508	1,909,780	1,999,433	2,630,854	.....
Dec.	1,740,912	2,635,680	1,777,817	2,043,270	2,782,737	.....

The Canadian Furnace Company, Ltd., subsidiary of the Buffalo Union Furnace Company, has completed its blast furnace at **Port Colborne, Ontario, and will blow** it in September 20.

For Uniformity in Boiler Construction

Opening Session of American Boiler Manufacturers' Association at Cleveland

The twenty-fifth annual convention of the American Boiler Manufacturers' Association is in session at Cleveland, Ohio, this week. The opening meeting was held Monday afternoon at the Hollenden Hotel, the convention headquarters, and the meeting will close with an executive session Thursday afternoon. The early registration was greater than at any previous meeting, the larger attendance being attributed to the interest that is being taken in the subject of uniform specifications for the construction of boilers, which was the principal matter to come up for action.

At the opening session an address of welcome was delivered by Mayor Newton D. Baker, to which Col. E. D. Meier, New York, president of the association, responded. The meeting was then addressed by Attorney A. V. Cannon, Cleveland, a member from Ohio of the committee on uniform boiler specifications of the National Conference on Uniform Laws. He spoke in favor of a uniform law for the construction of boilers rather than a uniform inspection law. He said that the committee of which he is a member had been appointed to take up this matter and to report at the meeting of the conference in Montreal this year. This committee had come to the conclusion that a uniform boiler inspection law would not be effective in bringing about uniformity, but that uniformity of construction was what was wanted. He referred to the present State laws on the subject, stating that they relate to inspection rather than to construction of boilers. A number of States have no inspection laws, and many cities have laws of their own on this subject. His recommendation to the boiler makers was that if they wanted uniform State laws they should employ engineers to prepare standard boiler specifications. He said that if this is done the conference would probably do all it could to have these specifications adopted as the standard by the various States.

President Meier said in reply that the boiler makers could lay down certain fundamental principles which could be embodied in uniform State laws, but that it would not be safe to provide all of the details of construction in such State laws.

George A. Luck, chairman of the Board of Boiler Rules of Massachusetts, explained some features of the Massachusetts inspection law. He said that since the enactment of the Massachusetts law over 9000 Massachusetts standard boilers had been built and that at the present time 104 boiler manufacturers throughout the country are authorized to make the Massachusetts standard boilers.

The question of uniform specifications and construction of boilers came up for action Tuesday afternoon when the committee on that subject, of which Colonel Meier is chairman, made its report. Considerable discussion of the matter followed, but it was unanimously adopted.

The Tuesday programme included the reading of three papers as follows: "Factory Efficiency," by Lucien I. Yeomans, Chicago; "Uniform Boiler Specifications," by Thomas E. Burban, general manager Erie City Iron Works, Erie, Pa.; "Shop Costs," by W. C. Connelly, president D. Connelly Boiler Company, Cleveland. The remainder of the business session was taken up with the appointments and reports of committees and various miscellaneous items.

Monday evening the members and guests attended a ladies' reception. Wednesday was spent by the members and ladies on a lake ride to Cedar Point, from which the party returned in the evening. The meeting will close with a banquet Thursday evening.

George S. Kellogg, president Steel Contractors' Association, Buffalo, announces that as the result of a conference between the representatives of the Bridge and Structural Iron Workers' Union and his association, held August 30, a satisfactory settlement was reached in reference to the wage scale for which the union men had been on strike for about a week. The men agreed to accept 62½c. per hour instead of 65c., for which they had been contending. The old rate now superseded was 60c. The men returned to work September 2.

The Iron and Metal Markets

Pig Iron Market Firmer

Decline in Production Checked

Readjustment of Values in Finished Materials Gradual—Heavier Business in Wire

August pig iron statistics show but little falling off from the output of July. At 2,545,763 tons, or 82,121 tons a day, production last month was but 480 tons a day less than in July, while July showed a falling off of 5000 tons a day from June and 8400 tons a day from May.

The two large new furnaces of the Pittsburgh Steel Company have been started in the Pittsburgh district, and in general the caliber of furnaces blowing in last month was greater than that of furnaces blowing out. Also a good many stacks did better in August than in July. Thus the estimated capacity of the 260 furnaces active on September 1 was nearly 800 tons a day more than that of the 266 furnaces active August 1, or 82,426 tons against 81,657 tons.

September output therefore promises to be close to that of September, 1912, which averaged 82,128 tons a day.

Markets for pig iron, billets and finished material reflect the readjustment in values that is under way. New buying is on a conservative scale. Contracts have been expiring, based on prices for mill products lower than those of recent months. In some cases a 10 per cent. advance on the last contract has been paid, leaving the new basis still below the level of the past six months.

The problem now to be worked out is that of finding on what lower level free buying will again become the rule and the steady reduction in unfilled orders be checked. What is most impressive is the extent to which the country is taking the output of the industry as it stands, indicating that no drastic price changes are immediately ahead.

Pig-iron prices are stiffening further, while easier conditions develop in certain finished lines. There is a beginning of pig-iron buying for delivery next year. Makers are asking 25 cents a ton more for first quarter than for last quarter delivery, making Southern No. 2 $11.25 Birmingham for first quarter while $11.50 is asked for first half. Foundry iron buying has quieted down, but even so a good many sellers, particularly Lake furnaces, find themselves well enough booked for this year to mark up prices 25 cents.

There has been no large new buying of basic or Bessemer iron, but a Central Western steel company which has had its own production cut down may be forced into the market. In eastern Pennsylvania 3000 tons of basic sold at $15 delivered, and an inquiry is up for 5000 tons. In the same district 5000 tons of gray forge was sold at $14.75 delivered, with inquiry for 3000 to 5000 tons pending.

Conditions in the semi-finished steel market are indicated by a recent readjustment of $27.50 sheet bar contracts to $26. There is not much new buying on the basis of $24 at mill for billets and $25 for sheet bars represented by recent offerings. One or two of the smaller steel companies have been more actively seeking business.

In eastern Pennsylvania billets can now be had at $26. Inquiries sent to England with a view to business after billets go on the free list have not been taken very seriously there, but the chance of business later is not overlooked.

Plate prices have more generally settled to 1.40c., Pittsburgh, business at that figure having been taken both in the East and the Central West. The Carnegie Steel Company has taken 4500 tons of plates for the new Government supply boat, the Melville. Early awards are expected of three boats for the Lake ore trade.

For Toronto harbor improvements soon to be let, 5000 tons of structural steel and reinforcing bars will be required. At Washington the Lincoln memorial will call for 3000 tons of sheet piling. For the Masonic Temple at Pittsburgh, 3000 tons of Bethlehem shapes are specified. The shading of 1.45c., Pittsburgh, on plain material is still reported.

Some heavy contracts have been placed for fall delivery of wire products and on some of the largest business $1.65 for wire nails and $1.45 for plain wire were not strictly held.

Two leading makers of wrought pipe have fully sold their output for the remainder of the year.

Reinforcement work continues an important factor in the demand for steel bars, and all bar mill products are in such demand that the 1.40c. Pittsburgh price has been free from the strain apparent in the markets for plates and shapes.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous.	Sept. 3, 1913.	Aug. 27, 1913.	Aug. 6, 1913.	Sept. 4, 1912.
Pig Iron, Per Gross Ton:				
Foundry No. 2 X, Philadelphia.	$15.75	$15.75	$15.50	$16.25
Foundry No. 2, Valley furnace.	14.00	14.00	14.00	14.25
Foundry No. 2 S'th'n, Cin'ti..	14.25	14.25	14.00	15.50
Foundry No. 2, Birmingham, Ala.	11.00	11.00	10.75	12.25
Foundry No. 2, furnace, Chicago*	15.00	15.00	15.00	15.50
Basic, delivered, eastern Pa....	15.00	15.00	15.25	16.50
Basic, Valley furnace	14.00	14.00	14.25	14.25
Bessemer, Pittsburgh	16.65	16.65	16.40	15.90
Malleable Bessemer, Chicago*..	15.00	15.00	15.00	15.50
Gray forge, Pittsburgh	14.25	14.25	14.25	14.65
Lake Superior charcoal, Chicago	15.25	15.25	14.50	16.25
Billets, etc., Per Gross Ton:				
Bessemer billets, Pittsburgh....	25.00	25.00	27.00	23.00
Open-hearth billets, Pittsburgh.	24.50	24.50	27.00	23.50
Open-hearth sheet bars, Pgh....	25.00	25.00	27.50	24.00
Forging billets, Pittsburgh	30.00	30.00	34.00	29.00
Open-hearth billets, Philadelphia	*26.00*	27.00	28.00	25.40
Wire rods, Pittsburgh	28.00	28.00	28.00	27.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.50
Iron rails, Philadelphia	17.50	17.50	17.50	16.50
Carwheels, Chicago	12.75	12.75	12.75	14.00
Carwheels, Philadelphia.....	12.50	12.50	12.50	14.00
Heavy steel scrap, Pittsburgh..	12.25	12.25	12.50	13.75
Heavy steel scrap, Chicago....	*10.25*	10.50	10.50	12.25
Heavy steel scrap, Philadelphia.	11.50	11.50	11.25	14.50
Finished Iron and Steel,				
Per Pound to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill...	1.25	1.25	1.25	1.25
Iron bars, Philadelphia.....	1.37½	1.37½	1.42½	1.40
Iron bars, Pittsburgh	1.60	1.60	1.65	1.40
Iron bars, Chicago	1.40	1.40	1.45	1.45
Steel bars, Pittsburgh.....	1.40	1.40	1.40	1.30
Steel bars, New York.....	1.56	1.56	1.56	1.46
Tank plates, Pittsburgh.....	1.40	1.40	1.45	1.40
Tank plates, New York.....	1.56	1.56	1.61	1.56
Beams, Pittsburgh	1.45	1.45	1.45	1.35
Beams, New York	1.61	1.61	1.61	1.56
Angles, Pittsburgh	1.45	1.45	1.45	1.35
Angles, New York	1.61	1.61	1.61	1.56
Skelp, grooved steel, Pittsburgh	*1.35*	1.40	1.45	1.25
Skelp, sheared steel, Pittsburgh	1.45	1.45	1.50	1.30
Steel hoops, Pittsburgh	1.50	1.50	1.60	1.40
Sheets, Nails and Wire,				
Per Pound to Large Buyers:				
Sheets, black, No. 28, Pittsburgh	2.15	2.15	2.25	2.05
Wire nails, Pittsburgh	1.65	1.65	1.70	1.70
Cut nails, f.o.b. Eastern mills..	1.75	1.75	1.75	1.70
Cut nails, Pittsburgh	1.60	1.60	1.60	1.60
Fence wire, ann'l'd. 0 to 9, Pgh.	1.45	1.45	1.55	1.50
Barb wire, galv., Pittsburgh....	2.05	2.05	2.20	2.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Coke, Connellsville,	Sept. 3, 1913.	Aug. 27, 1913.	Aug. 6, 1913.	Sept. 4, 1912.
Per Net Ton at Oven:				
Furnace coke, prompt shipment	$2.50	$2.50	$2.50	$2.15
Furnace coke, future delivery..	2.50	2.50	2.50	2.25
Foundry coke, prompt shipment	2.90	2.90	2.90	2.40
Foundry coke, future delivery..	3.00	3.00	3.00	2.50

Metals,	Cents.	Cents.	Cents.	Cents.
Per Pound to Large Buyers:				
Lake copper, New York.....	**16.25**	16.00	15.37½	17.75
Electrolytic copper, New York..	**16.12½**	15.62½	15.12½	17.62½
Spelter, St. Louis.....	5.75	5.75	5.45	7.20
Spelter, New York.....	5.90	5.90	5.60	7.35
Lead, St. Louis	4.67½	4.67½	4.37½	4.72½
Lead, New York.....	4.75	4.75	4.50	4.85
Tin, New York.....	**43.35**	42.60	41.50	47.20
Antimony, Hallett's, New York	7.75	7.75	7.75	7.87½
Tin plate, 100-lb. box, Pittsburgh	$3.50	$3.50	$3.60	$3.50

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Louis, 22½c.; Kansas City, 42½c.; Omaha, 42½c.; St. Paul, 32c.; Denver, 84½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in.....	.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including straight taper plates) 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, 3 in. and over, 1.45c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.....	.10
H-beams over 18 in.	.10
Angles over 6 in. on one or both legs.....	.10
Angles, 3 in. on one or both legs, less than ¼ in. thick, as per steel bar card, Sept. 1, 1909.....	.70
Tees, structural sizes (except elevator, hand rail, car-truck and conductor rail).....	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909.....	.20 to .80
Deck beams and bulb angles	.30
Hand rail tees	.75
Cutting to lengths, under 3 ft., to 2 ft. inclusive.....	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive.....	.50
Cutting to lengths, under 1 ft.....	1.55

No charge for cutting to lengths 3 ft. and over.

Wire Rods and Wire.—Bessemer, open-hearth and chain rods, $28 to $28.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days or 2 per cent. discount in 10 days, carload lots to jobbers, annealed, $1.45; galvanized, $1.85. Galvanized barb wire, to jobbers, $2.05; painted, $1.65. Wire nails, to jobbers, $1.65.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	2.10	2.10	2.15	2.20	2.30	2.40	2.80	2.90

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on steel pipe (full weight), in effect from August 8, 1913, and iron pipe (full weight), from June 2, 1913:

Butt Weld.

Steel. Inches.	Black.	Galv.	Iron. Inches.	Black.	Galv.
⅛, ¼ and ⅜.....	73	52½	⅛ and ¼	66	47
½	77	66½	⅜	65	46
¾ to 3	80	71½	½	69	56
			¾ to 2½	72	61

Lap Weld.

2	76	67½	1¼	56	45
2½ to 6.....	78	69½	1½	67	56
7 to 12	75	64½	2	68	58
13 to 15	52	..	2½ to 4	70	61
			4½ to 6	70	61
			7 to 12	68	55

Reamed and Drifted.

1 to 3, butt.....	78	69½	1 to 1½, butt	70	59
2, lap	74	65½	2, butt	70	59
2½ to 6, lap.....	76	67½	1¼, lap	54	43
			1½, lap	65	54
			2, lap	66	56
			2½ to 4, lap.....	68	59

Butt Weld, extra strong, plain ends.

⅛, ¼ and ⅜.....	68	57½	⅜	63	52
½	73	66½	½	67	60
¾ to 1½.....	77	70½	¾ to 1½	71	62
2 to 3	75	71½	2 and 2½	72	63

Lap Weld, extra strong, plain ends.

2	73	64½	1½	65	59
2½ to 4	75	66½	2	66	58
4½ to 6	74	65½	2½ to 4	70	61
7 to 8	67	56½	4½ to 6	69	60
9 to 12	62	51½	7 and 8	63	53
			9 to 12	58	47

Butt Weld, double extra strong, plain ends.

½	63	56½	½	57	49
¾ to 1½	66	59½	¾ to 1½	60	52
2 to 2½	68	61½	2 and 2½	62	54

Lap Weld, double extra strong, plain ends.

2	63	56½	2	55	49
2½ to 4	65	58½	2½ to 4	60	54
4½ to 6	64	57½	4½ to 6	59	53
7 to 8	57	46½	7 to 8	52	42

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts to jobbers, in carloads on lap-welded steel, in effect from May 29, 1913, and standard charcoal-iron boiler tubes, in effect from January 1, 1913, are as follows:

Lap-Welded Steel.		*Standard Charcoal Iron.*	
1¼ and 2 in.....	60	1½ in.	44
2¼ in.	57	1¾ and 2 in.....	48
2½ and 2¾ in.....	63	2¼ in.	44
3 and 3¼ in.....	67	2½ to 2¾ in.....	53
3½ to 4½ in.....	69	3 and 3¼ in.....	55
5 and 6 in.....	63	3½ to 4½ in.....	58
7 to 13 in.....	60		

Locomotive and steamship special grades bring higher prices.

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms 30 days net or 2 per cent. cash discount in 10 days from date of invoice:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.60
Nos. 9 and 10	1.65
Nos. 11 and 12	1.70
Nos. 13 and 14	1.75
Nos. 15 and 16	1.85

Box Annealed Sheets, Cold Rolled.

Nos. 10 and 11	1.80 to 1.90
No. 12	1.80 to 1.90
Nos. 13 and 14	1.85 to 1.95
Nos. 15 and 16	1.90 to 2.00
Nos. 17 to 21	1.95 to 2.05
Nos. 22 and 24	2.00 to 2.10
Nos. 25 and 26	2.05 to 2.15
No. 27	2.10 to 2.20
No. 28	2.15 to 2.25
No. 29	2.20 to 2.30
No. 30	2.30 to 2.40

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	2.20 to 2.30
No. 12	2.30 to 2.40
Nos. 13 and 14	2.30 to 2.40
Nos. 15 and 16	2.45 to 2.55
Nos. 17 to 21	2.60 to 2.70
Nos. 22 and 24	2.75 to 2.85
Nos. 25 and 26	2.90 to 3.00
No. 27	3.05 to 3.15
No. 28	3.20 to 3.30
No. 29	3.35 to 3.45
No. 30	3.50 to 3.60

Pittsburgh

PITTSBURGH, PA., September 3, 1913.

The most encouraging feature of the situation is that three of the large steel companies report specifications against contracts in August heavier than in July, and they look for a still larger increase in September. The opinion is that the market is shaping itself for a buying movement to come late this month or early in October. Consumers that have contracts expiring, based on prices for finished material considerably lower than are ruling now, are likely to go slow in the matter of making new engagements far ahead at present market values. One leading steel maker states that prices are undergoing readjustment and will likely settle down to a lower basis than exists at present. Once the trade becomes satisfied that prices have about reached bottom, a brisk buying movement is looked for, but as long as present market values hold new buying will be confined to only enough material to cover current wants. This applies to pig iron, semi-finished steel and finished material. The large consumers of pig iron are placing orders for only 30 to 45 days' supply. Prices on steel billets and sheet bars have gone off about $2.50 a ton, but most consumers are covered and there is not much new buying, even at the lower figures now ruling. The wire trade has been active in the past few weeks, and some heavy contracts have been placed in plain wire and wire nails for fall delivery. There has also been free buying in black and galvanized sheets by some large consumers, but others are still holding off waiting for lower prices. The steel bar mills are well filled up to the end of the year, and prices on current business are firm at 1.40c. at mill. The pipe trade continues very active in demand for lap-weld and line pipe, two leading makers stating they are sold up for the remainder of the year. The tone of the scrap market is firmer, but as yet prices are not any higher and demand is dull. Several contracts for standard furnace coke for the remainder of the year have been placed at $2.50 at oven, and indications are strong that this price will hold firm through September at least.

Pig Iron.—Following the recent activity and heavy sales of Bessemer and basic, conditions in the local pig-iron market have quieted down and there is little active new inquiry and only for small lots. Three local open-hearth plants are said to have enough basic iron to run them through September, but will need to buy for their requirements commencing with October. The Republic Iron & Steel Company put out its Hall furnace at Sharon, Pa., last week, and its Red Jacket furnace at New Castle, Pa., is working badly, so that this company may possibly be in the market before long for basic or Bessemer iron, or both. The Steel Corporation is in the market for 10,000 to 15,000 tons of Bessemer iron, and may buy before the week is out. The Pressed Steel Car Company is in the market for 4000 to 5000 tons of malleable Bessemer iron for its foundry at McKees Rocks, but has not yet closed. We quote: Bessemer, $15.75 to $16; basic, $14 to $14.25; malleable Bessemer, $13.75 to $14; No. 2 foundry, $14; gray forge, $13.35 to $13.50, all at Valley furnace, the freight rate for delivery to the Cleveland and Pittsburgh districts being 90c. a ton, while the freight rate from the Midland, Pa., blast furnace is 65c. a ton.

Billets and Sheet Bars.—The market is quiet and prices are only fairly strong. Small open-hearth plants are offering billets at $24 to $24.50 and sheet bars at about $25 at mill, but most consumers are covered by contracts, and are not buying. Several steel mills have recently readjusted contracts on open-hearth and Bessemer sheet bars from $27.50 to $26, at maker's mill. The Pittsburgh Crucible Steel Company is offering open-hearth billets and slabs quite freely, and the supply of steel at present is ample to meet all requirements. Three, and possibly four, 80-ton open-hearth furnaces in the new steel plant of the Carnegie Steel Company at Bessemer will be on this week. We quote open-hearth billets for prompt delivery, and also for shipment over remainder of the year at $24.50 to $25; open-hearth sheet bars for the same deliveries at $25 to $25.50, delivered to buyers' mills in the Pittsburgh district. For billets and sheet bars made from Bessemer steel, the larger mills are asking about $1 a ton advance over these prices. We quote forging billets at $30 to $31, and axle billets at $26 to $27, maker's mill.

Steel Rails.—The leading railroads are now making up estimates on their requirements of steel rails for 1914 delivery, but as yet no active inquiries are out. It is said the initial inquiry of the Pennsylvania Railroad will be for 150,000 tons, but this is only surmise. It is known, however, that it will need much more than that quantity for next year, its Western lines alone needing that much, but probably they will have to get along with considerably less. Small orders for standard sections are being freely placed, and they aggregate considerable tonnage. The new demand for light rails is active, the Carnegie Steel Company having received new orders and specifications against contracts for 3923 tons last week. We quote splice bars at 1.50c. per lb. and standard section rails at 1.25c. per lb. Light rails are quoted as follows: 25, 30, 35, 40 and 45 lb. sections, 1.25c.; 16 and 20 lb., 1.30c.; 12 and 14 lb., 1.35c., and 8 and 10 lb., 1.40c., all in carload lots, f.o.b. Pittsburgh.

Plates.—Railroads are buying very little, no new orders for steel cars having been placed in the past week and inquiries are light. The Carnegie Steel Company has taken 4500 tons of steel plates for the Melville, the new supply boat to be built by the Government. A number of the smaller plate mills are quoting ¼-in. and heavier plates at 1.40c. or less for delivery in two weeks, and universal plates at the same price for delivery in four to six weeks. Specifications against contracts for plates are still coming in freely, but large consumers like the steel car companies are working on old orders only. We quote ¼-in. and heavier plates at 1.40c. to 1.45c., Pittsburgh, and on a firm offer, for desirable tonnage, the lower price might be shaded.

Structural Material.—New inquiry has been fairly active, and considerable business has been placed. The American Bridge Company has taken 2000 tons for an 18-story office building to be built in Detroit by S. S. Kresge, the 5 and 10-cent store owner. The McClintic-Marshall Construction Company has taken 500 tons for an addition to the power house of the Duquesne Light Company on Brunot's Island, and 400 tons for a new steel building for the Forged Steel Wheel Company at Butler, Pa. Inquiries are out for the material, about 3000 tons, for the new Masonic Temple in this city, and the plans specify Bethlehem shapes. Prices on plain material are fairly strong at 1.45c. on current orders, but on a very desirable specification, this would be shaded. We quote beams and channels up to 15 in. at 1.45c., Pittsburgh.

Wire Rods.—Following the heavy sales of wire products during August new inquiry for rods is better, but prices are only fairly firm. We quote Bessemer, open-hearth and chain rods at $28, Pittsburgh, but on a firm offer for a desirable order $27.50 could be done.

Ferroalloys.—New inquiry for ferromanganese is confined to small lots for prompt shipment, consumers not desiring to take hold for forward delivery at present prices, believing the market will be lower. There is no trouble in getting carload lots of 80 per cent. at $55, seaboard, two or three cars having been sold in the past week at this price. We quote 80 per cent. foreign ferromanganese at $55 to $56, seaboard, the freight rate to the Pittsburgh district being $2.16 a ton. We quote 50 per cent. ferrosilicon, in lots up to 100 tons, at $75; over 100 tons to 600 tons, $74; over 600 tons, $73, Pittsburgh. We quote 10 per cent. ferrosilicon at $22; 11 per cent., $23, and 12 per cent. $24, f.o.b. cars Jackson County, Ohio, or Ashland, Ky., furnaces. We note a sale of two cars of 10 per cent. at $22 at furnace.

Skelp.—The pipe mills are filled to the end of the year on lap-weld and line pipe, and as a result the new demand for skelp is active and the mills are pretty well sold up for two or three months. Prices are not as firm as they have been. We quote grooved sheared skelp at 1.35c. to 1.40c.; sheared steel skelp, 1.40c. to 1.45c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.65c. to 1.70c., delivered to buyers' mills in Pittsburgh district.

Iron and Steel Bars.—Most consumers, both large and small, have placed contracts for their requirements of steel bars for a considerable time ahead and new inquiry is light, but specifications against contracts are coming in at a fair rate. Demand for steel bars for reinforcing purposes continues heavy; two leading makers are practically sold up for this year and are getting further back in deliveries. Some makers of steel bars are caught up on back obligations and are able to make fairly prompt shipments. The new demand for iron bars is quiet and there is no trouble in getting prompt deliveries. Prices on iron bars are weak. We quote steel bars for forward delivery at 1.40c. and for shipment from warehouse in small lots at 1.90c. We quote iron bars at 1.60c. to 1.70c. The mills continue to charge $1 extra per ton for twisting ¾-in. and larger steel bars and $2 extra for ½ to ⅝ in. In some cases, however, these extras are being shaded.

Sheets.—A fair amount of new business in black, galvanized and blue annealed sheets is being placed by the smaller consumers, but the new demand is still confined mostly to small lots to cover current needs. Some of the larger consumers of sheets feel that while present prices are low compared with costs the new producing capacity that has come on the market lately may possibly bring about still lower values, as competition for business is severe. On No. 28 Bessemer black sheets 2.15c. is generally quoted on desirable orders and 3.20c. on No. 28 galvanized. The American Sheet & Tin Plate Company is running this week to about 70 per cent. of its hot sheet mill capacity. We quote Nos. 9 and 10 blue annealed sheets at 1.65c.; No. 28 Bessemer black, 2.15c.; No. 28 galvanized, 3.20c.; No. 28 tin mill black plate, 2.15c. to 2.20c., and No. 30, 2.20c. to 2.25c. These prices are f.o.b. Pittsburgh, in carload and larger lots, jobbers charging the usual advances for small lots from store.

Tin Plate.—The output of tin plate in the Pittsburgh district has been increased to some extent by the starting up of the Clarksburg works of the Phillips Sheet & Tin Plate Company, which was closed for some weeks through a sympathy strike. The new demand for tin plate is dull, as fall buying has not yet started, but the mills report that specifications against contracts are heavy. One leading consumer is reported to have placed 40,000 boxes in the past week, for which very close to $3.60 was said to have been obtained. As yet the price on tin plate on large contracts for next year has not been fixed, but it is intimated it will be close to the basis of $3.50 at maker's mill. The supply of Bessemer and open-hearth bars is now ample to meet demands, and tin plate mills are getting steel as fast as needed. This week the American Sheet & Tin Plate Company is operating to about 84 per cent. of hot tin mill capacity. We quote 100-lb. cokes at $3.50 to $3.60, and 100-lb. ternes at $3.35 to $3.45, Pittsburgh, the higher prices being quoted for small lots.

Spikes.—No large inquiries are out. For some months railroads have not been buying very heavily, their orders being free but only for small lots to cover current needs. The makers have caught up on back orders and are able to ship out promptly. We quote railroad spikes in base sizes, 5½ x 9/16 in., at $1.65 to $1.70, and small railroad and boat spikes in carload and larger lots at $1.75 to $1.80 per 100 lb., f.o.b. Pittsburgh.

Bolts and Rivets.—Makers report that prices on nuts and bolts are firmer than for some time, and new demand is better. One leading jobber is reported to have placed a contract for 300 tons of bolts for delivery at convenience of the maker. Prices on rivets continue to be shaded on desirable orders. We quote button-head structural rivets at $1.90 in large lots and $2 in small lots, and cone-head boiler rivets at $2 in large lots and $2.10 in small lots, terms 30 days net, less 2 per cent. for cash in 10 days. Regular discounts on nuts and bolts are as follows in lots of 300 lb. or over, delivered within a 20c. freight radius of maker's works:

Coach and lag screws	80 and 10% off
Small carriage bolts, cut threads	75 and 5% off
Small carriage bolts, rolled threads	75 and 10% off
Large carriage bolts	70 and 2½% off
Small machine bolts, cut threads	75 and 10% off
Small machine bolts, rolled threads	75, 10 and 5% off
Large machine bolts	70 and 7½% off
Machine bolts with C.P.C. and T nuts, small	75 and 5% off
Machine bolts with C.P.C. and T nuts, large	70% off
Square hot pressed nuts, blanked and tapped	$5.70 off list
Hexagon nuts	$6.30 off list
C.P.C. and R. square nuts, tapped and blank.	$5.70 off list
Hexagon nuts, ⅜ and larger	$6.60 off list
Hexagon nuts smaller than 9/16	$7.20 off list
C.P. plain square nuts	$5.20 off list
C.P. plain hexagon nuts	$5.50 off list
Semi-finished hexagon nuts, ⅝ and larger	85% off
Semi-finished hex. nuts smaller than 9/16	85 and 10% off
Rivets, 7/16 x 6½, smaller and shorter	75, 10 and 10% off
Rivets, metallic tinned, bulk	3½c. per lb. net extra
Rivets, tin plated, bulk	1½c. per lb. net extra
Rivets, metallic tinned, packages	70, 10 and 10% off
Standard cap screws	75, 10, 10 and 7½% off
Standard set screws	75, 10, 10 and 7½% off

Shafting.—Several makers report the new demand better and prices firmer. Most consumers are still buying in small lots to cover actual needs, and specifications against contracts are fair. Regular discounts on cold-rolled shafting remain at 60 off in carloads and 55 in small lots, but on desirable orders 62 off is still being done.

Hoops and Bands.—The new demand is quiet and only for small lots, as consumers are covered ahead on contracts against which specifications are only moderate. The mills rolling hoops and bands are pretty well caught up on back orders, and consumers are able to get prompt deliveries. We quote steel hoops at 1.50c. and bands at 1.40c., with extras on the latter as per the steel bar card.

Wire Products.—A very heavy business in wire and wire nails was placed in August on the basis of about $1.65 on wire nails and $1.45 on plain annealed wire, but it is stated that on very desirable contracts from larger consumers these prices were shaded. The leading interest is said to have booked orders for wire products during a good part of August at the rate of 7000 tons per day. If specifications come in freely the wire mills will likely be busy for the remainder of this year. The opinion still prevails that this month there may be an advance in prices of wire products to stimulate the specifications against the heavy contracts recently placed. We quote: Wire nails to jobbers, $1.65; cut nails, $1.60; plain annealed wire, $1.45; galvanized barb wire, $2.05, and painted barb wire, $1.65, f.o.b. Pittsburgh, per 100 lb., usual terms, actual freight added to point of delivery.

Merchant Steel.—New buying is still confined to small lots, and specifications are not heavy. Consumers feel that, with prices weak, there is no incentive to anticipate and are buying only to cover current wants. Shipments by two leading makers in August were slightly heavier than in July. Nominal prices, which are being shaded more or less, depending on the order, are as follows: Iron finished tire, 1½ x ½ in. and larger, 1.40c., base; under 1½ x ½ in., 1.55c.; planished tire, 1.60c.; channel tire, ¾ to ⅞ and 1 in., 1.90c. to 2c.; 1⅛ in. and larger, 2c.; toe calk, 2c. to 2.10c., base; flat sleigh shoe, 1.75c.; concave and convex, 1.80c.; cutter shoe, tapered or bent 2.30c. to 2.40c.; spring steel 2c. to 2.10c.; machinery steel smooth finish 1.85c. We quote cold rolled strip steel as follows: Base rates for 1 in. and 1½ in. and wider, under 0.20 carbon, and No. 10 and heavier, hard temper, 3.30c.; soft, 3.55c.; coils, hard, 3.20c.; soft, 3.45c.; freight allowed. The usual differentials apply for lighter gauges and sizes.

Standard Pipe.—Two leading makers state that on lap-weld and line pipe they are sold up for the remainder of the year. Several of the smaller mills have not sold so far ahead, but are covered for the next month or two, and all report the new demand heavy. An inquiry is in the market from one of the Armstrong gas interests for 20 miles of 8-in. pipe for prompt delivery. The new demand for butt weld is only fair, but for oil country goods is heavy. Two of the leading makers of iron pipe are rolling it only for regular consumers, being short of muck bar, on account of the fact that they have not signed the Sons of Vulcan puddling scale. No large inquiries for line pipe are in the market, and it is so late in the season that it is doubtful whether any of the mills could take a large order at this time, and make deliveries wanted. Discounts on iron and steel pipe, particularly iron, are firm.

Boiler Tubes.—The new demand is fairly heavy, but mills are filled up on contracts placed some time ago against which specifications are coming in freely. The demand for seamless tubing is heavy, and the two makers are pretty well sold up over the remainder of the year. Discounts on iron and steel tubes are reported firm.

Coke.—A new reason has been given for the determination of the independent coke operators to hold up the price of furnace coke. It is said that a few years ago some banks bought bonds of a number of coke companies with the stipulation that the bonds were to be redeemed by the companies paying the banks 75c. on every ton of coke shipped out. While the coke market is quiet prices are maintained. An Eastern consumer of furnace coke has bought 12,000 tons per month for the last four months of this year at $2.50 per net ton at oven, the business being equally divided between two sellers. The New Jersey Zinc Company is reported to have bought upward of 25,000 tons for delivery over the remainder of the year at $2.50, but it is said the price was guaranteed against decline. A Cleveland consumer is in the market for a round tonnage of furnace coke. Against the above we can state that a leading coke interest has recently sold a considerable tonnage for delivery over the remainder of the year at $2.40 or less at oven. It is said that the coke plants controlled by the Producers Coke Company, Uniontown, Pa., are operating to only about 50 per cent. of capacity. Another leading Connellsville coke interest that was running full two months ago is now operating only 80 per cent. of its ovens, and is selling its surplus coal in the open market, finding a good demand for it at profitable prices. We quote standard makes of furnace coke for prompt delivery at $2.50 and 72-hr. foundry coke at $2.90 to $3 per net ton

at oven. The Connellsville Courier reports the output of coke for the week ended August 23 as about 390,000 tons, a decrease over the previous week of about 10,000 tons.

Old Material.—There is no improvement in the demand, but the tone of the market is stronger. Several of the leading dealers are not seeking business aggressively, preferring to pile scrap rather than take the low prices that are ruling. It is believed that better things are ahead of the scrap trade in the near future, as a good deal of new open-hearth steel capacity has lately come in the market, and there will be more. There have been sales in the past week of 3000 to 5000 tons of selected heavy steel scrap at about $12.75, delivered at buyers' mills. Ordinary steel scrap is held at about $12.50, but this would be shaded. Bundled sheet scrap is weak and sales of 1000 to 1200 tons were made the past week at about $8, delivered at consumers' mills. New inquiry for borings and turnings is quiet, consumers being covered ahead, but prices are fairly strong. A sale of 400 tons of cast-iron borings is reported at $8.25, delivered buyer's mill. Dealers quote as follows, per gross ton, for delivery in the Pittsburgh district:

Selected heavy steel scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$12.75 to	$13.00
Ordinary steel scrap	12.25 to	12.50
Compressed side and end sheet scrap		10.50
No. 1 foundry cast	12.75 to	13.00
No. 2 foundry cast	11.50 to	11.75
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	8.00 to	8.25
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	14.50 to	14.75
No. 1 railroad malleable stock	11.50 to	11.75
Grate bars	8.25 to	8.50
Low phosphorus melting stock	15.75 to	16.00
Iron car axles	24.50 to	25.00
Steel car axles	17.50 to	17.75
Locomotive axles, steel	21.00 to	21.50
Locomotive axles, iron	25.50 to	26.00
No. 1 busheling scrap	12.00 to	12.25
No. 2 busheling scrap	7.50 to	7.75
Old carwheels	13.75 to	14.00
*Machine shop turnings	6.75 to	7.00
*Cast-iron borings	8.25 to	8.50
†Sheet bar crop ends	14.00 to	14.25
Old iron rails	14.50 to	14.75
No. 1 railroad wrought scrap	13.75 to	14.00
Heavy steel axle turnings	9.00 to	9.25
Stove plate	8.25 to	8.50

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Chicago

CHICAGO, ILL., September 3, 1913.—(*By Telegraph.*)

While the amount of new business obtained on most lines is not of any great degree, the undertone is firmer. Pig-iron sales continue light, being confined for the most part to small orders, but furnace prices are strong and deliveries are being made in accordance with the most sanguine anticipations. Southern iron is now firmly established on the basis of $11, Birmingham, for No. 2 foundry, the differential for prompt shipment having disappeared. Rails and track supplies are without particular interest, with the exception of a stronger belief that railroad buying of considerable proportions will develop in the near future. Structural orders continue to be confined to small lots, while bars show considerable improvement in specifications. Plates and cast-iron pipe are very quiet. A volume of business in wire products which is fairly satisfactory has developed since the prices now ruling became recognized, and the market on these is strong at quoted prices. Sheets also show a firmer tendency. The scrap market is quiet, with lower prices ruling and little business.

Pig Iron.—It is understood that the implement maker reported last week as inquiring for iron has placed contracts for about 1500 tons at market prices and will doubtless make further purchases this week. No additional inquiries worthy of note have appeared, though there is a fair volume obtained from small orders up to 500 tons. Melters are insisting on prompt deliveries on their contracts, showing that they are using iron in accordance with their anticipations. The price of $10.75 for spot orders of Southern iron, Birmingham basis, has disappeared, and orders at these prices were refused during the week, one tonnage of this nature being closed at the ruling price. Offers of $11, Birmingham, have been made for the first quarter of next year, but are rejected, makers holding firm for 25c. advance for that period and apparently not over anxious for business on that basis. An electrical firm mentioned some weeks ago as in the market closed during the week for 200 tons, bringing its purchases practically up to the original inquiry. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace and do not include a local switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 1, 2, 3, 4	$15.25 to $16.25
Northern coke foundry, No. 1	15.50 to 16.00
Northern coke foundry, No. 2	15.00 to 15.50
Northern coke foundry, No. 3	14.50 to 15.00
Southern coke, No. 1 foundry and No. 1 soft	15.85
Southern coke, No. 2 foundry and No. 2 soft	15.35
Southern coke, No. 3	14.85
Southern coke, No. 4	14.35
Southern gray forge	14.35
Southern mottled	14.10
Malleable Bessemer	15.00 to 15.50
Standard Bessemer	18.40
Basic	15.00 to 15.50
Jackson Co. and Kentucky silvery, 6 per cent	18.40
Jackson Co. and Kentucky silvery, 8 per cent	19.40
Jackson Co. and Kentucky silvery, 10 per cent	20.40

(By Mail)

Rails and Track Supplies.—Increasing confidence prevails that the railroads will be unable to postpone much longer the purchase of rails and track material for maintenance work. So far no inquiries have appeared and none are expected for extension work until next year, but it is not regarded as practicable to delay for any considerable time the purchase of material for other purposes. There is the usual amount of small ordering to fill immediate necessities. We quote standard railroad spikes at 1.75c. to 1.80c., base; track bolts with square nuts, 2.25c. to 2.30c., base, all in carload lots, Chicago; tie plates, $30 to $32, net ton; standard section Bessemer rails, Chicago, 1.25c., base; open-hearth, 1.34c.; light rails, 25 to 45 lb., 1.25c.; 16 to 20 lb., 1.30c.; 12 lb., 1.35c.; 8 lb., 1.40c.; angle bars, 1.50c., Chicago.

Structural Material.—Contracts reported for structural material the past week total about 3000 tons. A feature which is regarded as favorable is the contracting for bridge material. Fabricators report sufficient contracts now booked to carry the shops through the year, though deliveries are good and business is aggressively sought at current prices. The Baker Iron Works will supply 600 tons to the Sefton Investment Company for a hotel building in Los Angeles, Cal. Contract has been placed for 117 tons to be used in a building for the Silica Iron Works, Ottawa, Ill. The Chicago, Burlington & Quincy Railroad has let 106 tons of bridge work to the American Bridge Company, which will also fabricate 465 tons for the Chicago, Milwaukee & St. Paul. The Wisconsin Bridge & Iron Company will furnish 137 tons to the Chicago, Milwaukee & St. Paul for bridges and subway work. The Minneapolis Steel & Machinery Company will supply 563 tons to the Crescent Elevator Company for grain tanks at Minneapolis, Minn. The Iowa Bridge Company has let 343 tons to the Modern Steel Structural Company for a 960-ft. viaduct. The Clinton Bridge Works, Clinton, Ind., will supply 126 tons for various bridge spans. We quote for Chicago delivery, from mill, 1.63c.

A good demand for structural shapes is reported out of store, showing an increase over previous weeks. We quote for Chicago delivery, from store, 1.95c.

Bars.—There has been a noticeable increase in specifications for steel bars, local interests stating that it is the greatest improvement noted in some time. Little new business has appeared, except in reinforcing bars, which are in large demand. Mills have sufficient bookings to carry them well through the year, and this market is doubtless the strongest of any of the steel products. Iron bars show an increase, both in new business and in specifications against previous orders. The market on iron bars is firm at quoted prices with numerous instances of higher prices than the minimum being paid. We quote for mill shipment as follows: Bar iron, 1.40c. to 1.45c.; soft steel bars, 1.58c.; hard steel bars, 1.50c.; shafting in carloads, 60 per cent. off; less than carloads, 55 per cent. off.

Out of store the demand has been especially heavy for reinforcing bars, with a fair tonnage on other grades. For delivery from store we quote soft steel bars, 1.85c.; bar iron, 1.85c.; reinforcing bars, 1.85c. base, with 5c. extra for twisting in sizes ½ in. and over, and usual card extras for smaller sizes; shafting 53 per cent. off.

Wire Products.—An increased demand from retailers at the new price level is influencing the demand from jobbers. No indication of speculative buying is noted, but the smaller sales are affording a volume which is quite an improvement over conditions which existed a short time previous. Prices to jobbers are as follows: Plain wire, No. 9 and coarser, base, $1.63; wire nails, $1.83; painted barb wire, $1.83; galvanized, $2.20; polished staples, $1.83; galvanized, $2.15, all Chicago.

Plates.—There is less new business in plates than in any other finished product in this market. However, mills are well taken care of by contracts sufficient to carry them to the first of the next year in most cases, and no weakness in the quoted prices is apparent. We quote for Chicago delivery, from mill, 1.63c.

Store prices on plates are 1.95c.

Cast-Iron Pipe.—Bids on the new specifications for pipe at Springfield, Ohio, have been opened but no award has been made to date. Detroit, Mich., opened bids last Thursday for 125 tons, not yet awarded. A contract for 300 tons at Minneapolis, Minn., was awarded last week to the United States Cast Iron Pipe & Foundry Company. We quote as follows per net ton, Chicago: Water pipe, 4-in., $28; 6 to 12-in., $26; 16-in. and up, $25, with $1 extra for gas pipe.

Sheets.—There is still an active demand in the sheet market, with mills seeking most aggressively business for immediate shipment. While the largest agricultural interests have placed contracts for their requirements, there is still some business being placed by other manufacturing consumers in the same trade, one or two small orders being reported as booked the past week without any announcement of the tonnage purchased. For the most part buying is confined to the jobbing trade, and though of a conservative nature a sufficient number of orders is being had to provide a fair volume. We quote for Chicago delivery, from mill: No. 10 blue annealed, 1.83c. to 1.88c.; No. 28 black, 2.38c. to 2.43c.; No. 28 galvanized, 3.43c. to 3.48c.

We quote for Chicago delivery, from store, No. 10 blue annealed, 2.15c.; No. 28 black, 2.75c.; No. 28 galvanized, 4c.

Old Material.—The scrap market continues quiet, with some additional evidences of weakness. For the most part, dealers are confining their efforts to the sale of material which has been purchased and on which delivery is now being asked, and the consumers are not showing a spirit of anticipation in their purchases. A railroad list of the Baltimore & Ohio reported last week as 1200 tons should have read 12,000 tons, and it is understood that this tonnage was disposed of. This week the Michigan Central has issued a list of 1000 tons and the Standard Oil Company offers 500 tons. Lists without definite tonnages have also been sent out by the Erie and the Lake Shore. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton.

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	11.25 to 11.75
Relaying rails, standard section, subject to inspection	24.00
Old carwheels	12.75 to 13.25
Heavy melting steel scrap	10.25 to 10.75
Frogs, switches and guards, cut apart	10.25 to 10.75
Shoveling steel	10.00 to 10.50
Steel axle turnings	7.25 to 7.75

Per Net Ton.

Iron angles and splice bars	$13.50 to $14.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.00 to 10.25
Iron car axles	20.25 to 20.75
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	10.25 to 10.75
Cut forge	10.00 to 10.50
Steel knuckles and couplers	10.25 to 10.50
Steel springs	10.50 to 11.00
Locomotive tires, smooth	11.50 to 12.00
Machine shop turnings	4.90 to 5.15
Cast and mixed borings	4.75 to 5.25
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.25 to 7.75
Boiler punchings	10.50 to 11.00
No. 1 cast scrap	10.75 to 11.25
Stove plate and light cast scrap	9.50 to 10.00
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.25

Rivets and Bolts.—Jobbers, small manufacturers and automobile interests are placing orders for bolts in sufficient quantities to lend strength to prices, but no actual advances are noted. One large automobile concern closed last week for its requirements to cover quite a period. For the most part orders are confined to carload lots. We quote from mill as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 75-10-7½; cut thread, 75-12½; larger sizes, 70-12½; machine bolts up to ⅜ x 4 in., rolled thread, 75-10-12½; cut thread, 75-10-7½; large size, 70-10-5; coach screws, 80-12½-5; hot pressed nuts, square head, $6 off per cwt., hexagon, $6.70 off per cwt. Structural rivets, ¾ to 1¼ in., 2.03c., base, Chicago, in carload lots; boiler rivets, 0.10c. additional.

Out of store we quote for structural rivets, 2.70c., and for boiler rivets, 2.90c. Machine bolts up to ¾ x 4 in., 70-7½; larger sizes, 65-5, carriage bolts up to ⅜ x 6 in., 70-5; larger sizes, 65 off. Hot pressed nuts, square head, $5.30, and hexagon, $5.90 off per cwt.

Philadelphia

PHILADELPHIA, PA., September 2, 1913.

The volume of business in pig iron has been large, covering all grades. There has been a further slight hardening of prices on the part of some producers and quotations for first quarter of next year are coming out. The price of rolling mill forge has been established at $14.75 delivered in this district. Generally the pig-iron market is strong and the outlook favorable. The finished material situation is spotty. Some sellers are holding prices firmly while others are inclined to meet conditions as they find them. On large business recent plate and shape prices could no doubt be shaded. Mills on the average operate at 70 to 85 per cent. of capacity. Billets are quiet and prices are a trifle easier. Sheets have been in more active demand. The old material market is quiet, but prospects of greater interest in some grades are apparent. Coke remains quiet.

Iron Ore.—No interest is shown in the market. Arrivals of foreign ore have been heavy and docking and unloading facilities are being taxed to the limit. On one day last week an aggregate of nearly 30,000 tons arrived from Sweden and Cuba. The first cargo of Texas ore from Port Bolivar, some 3000 tons, is expected to arrive this week. Importations during the week ended August 30 included 27,919 tons from Sweden, 3400 tons from Africa, 11,320 tons from New Brunswick and 11,400 tons from Cuba.

Pig Iron.—Sellers continue to report good sales in practically all grades. The last few weeks in August showed a steady increase not only in the volume of business but also in prices, and from the nature of inquiries in hand little cessation in buying is in sight. The most important transactions have been in rolling mill forge iron. One large Eastern producer-consumer came in the market for a considerable quantity. Sales aggregating 5000 tons of this grade for early shipment have been made at $14.75 delivered and further inquiries for 3000 to 5000 tons for later shipment are pending. Several sellers are now holding at slightly higher prices for this grade. A sale of 3000 tons of basic iron has been made to an Eastern steel maker at $15 delivered. This nets the seller a higher furnace price than that obtained against a recent sale at the same figure in that the freight rate was 45c. a ton less than in the former transaction. A central Pennsylvania steel maker, who recently bought basic iron for third quarter delivery, is now out with an inquiry for several thousand tons for November-December shipment. Low-phosphorus grades have been rather quiet. In the higher grades of foundry iron the most important transaction was that covering 4000 tons of No. 2 X for the Baldwin Locomotive Works for fourth quarter delivery, which is understood to have been placed with Southern producers. The movement in the standard brands of eastern Pennsylvania irons has been largely in moderate lots. Consumers are freely placing orders for quantities ranging from carloads to a few hundred tons, and prices for No. 2 X foundry are now pretty firmly established at a minimum of $15.75 delivered. At the same time sales in quantity are being made at $15.85 and $16 delivered, and with less frequency at somewhat higher figures. One seller maintains the price for this grade at $16.50 and another $16.75, both taking some little business at those figures. The movement in Virginia foundry iron continues active. Sales in moderate lots have been made in considerable quantity. No. 2 X Virginia foundry is still available at $13 at furnace, although a number of producers hold at $13.25. Cast-iron pipe makers in this district are still buying low-grade iron, but no large sales have been reported. One interest would take on considerable iron at a price. General foundry iron inquiries are encouraging, although the maximum quantities asked for range from 200 to 300 tons, together with an occasional larger inquiry. More inquiry for pig iron for delivery over the first quarter of 1914 has developed and some furnaces quote $15.75 and others $16 delivered for No. 2 X for such forward shipment. Furnace order books will show a material gain in unfilled tonnages in August, and with decreased production and continued regular shipments stocks are expected to show a considerable decline. The following range of prices is named for standard brands delivered in buyers' yards in this district for shipment the remainder of the year and in instances for the first quarter of 1914:

Eastern Pennsylvania No. 2 X foundry	$15.75 to $16.00
Eastern Pennsylvania No. 2 plain	15.50 to 15.75
Virginia No. 2 X foundry	15.80 to 16.25
Virginia No. 2 plain	15.75 to 16.00
Gray forge	14.75 to 15.00
Basic	15.00 to 15.25
Standard low phosphorus	23.00 to 23.50

Ferroalloys.—Business appears to be at a standstill as far as buying in this market is concerned. There is an absence of any important inquiry for either ferromanganese or ferrosilicon. Eighty per cent. ferromanganese is nominally quoted at $56 seaboard, but is considered weak. Ferrosilicon prices remain unchanged. Importations of ferromanganese at this port during the week ending August 30 aggregated 461 tons.

Billets.—Business has been light. Eastern mills continue to operate below capacity basis. New inquiries of importance are meager. Current sales of basic open-hearth rolling billets have been made, in lots of several hundred tons, at $26, and $26 to $27 delivered about represents the range of the market. Forging steel is quiet. Nominal quotations for ordinary forging billets range from $31 to $33.

Plates.—Business has been in slightly smaller volume although capacity basic continues at one Eastern mill. Recent sales have been principally in moderate lots, ranging up to a few hundred tons, for which makers usually obtain 1.60c. delivered in this district. Contracts for 3800 tons of ship plates are expected to be placed by a local yard within the next two weeks. Less is heard of price shading on small lots, although on large propositions some makers would no doubt make concessions. Heavy line pipe business recently figured on is still unclosed.

Structural Material.—Specifications are out for structural work for the new Ford Motor Company's building, which is estimated to require from 2500 to 5000 tons. The Reading Railway is taking bids on 600 to 1000 tons of bridge work for grade crossings and the Pennsylvania has several hundred tons of bridge work under negotiation. Miscellaneous business continues in good volume but mill capacities have not been severely taxed. On current small business 1.60c. delivered in this district still rules, although on large quantities this figure has been and can be slighthly shaded.

Sheets.—The volume of small orders has increased, and Eastern mills, while operating at full capacity, have, in instances, been falling behind in delivery, particularly if shipment was promised at an early date. Western sheets are unchanged at 1.80c. minimum for No 10 blue annealed, although for early shipment Eastern mills, making smooth loose-rolled sheets, obtain up to 1.90c. delivered.

Old Material.—Little business has been moving in any grade, although the feeling in general is more optimistic. Holders of heavy melting steel are disposed to retain supplies, awaiting better prices. Mills offer from $11.50 to $11.75 delivered, but sellers refuse to take orders involving any quantity at that basis. Some of the specialties, such as steel axles and iron rails, are in better demand. More interest is shown in turnings and borings, while stove plate and railroad grates have been more freely sold. Interest in wrought-iron scrap is better. Quotations are still somewhat irregular and to a large extent nominal; an approximate range for delivery in buyers' yards in this district, covering eastern Pennsylvania, taking freight rates varying from 35c. to $1.35 per gross ton, is as follows:

No. 1 heavy melting steel	$11.50 to $12.00
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	18.00 to 18.50
Old iron axles (nominal)	25.00
Old iron rails	17.50 to 18.00
Old carwheels	12.50 to 13.00
No. 1 railroad wrought	14.50 to 15.00
Wrought-iron pipe	11.00 to 11.50
No. 1 forge fire	9.75 to 10.25
No. 2 light iron (nominal)	6.00
No. 2 cut busheling (nominal)	8.00 to 8.25
Wrought turnings	8.00 to 8.50
Cast borings	8.00 to 8.50
Machinery cast	12.75 to 13.25
Grate bars, railroad	9.50 to 10.00
Stove plate	9.50 to 10.00
Railroad malleable (nominal)	11.00 to 11.50

Coke.—The market is strong but not particularly active. Contract furnace coke is held at $2.50 at oven, but few contracts have been entered. Moderate sales of prompt furnace coke have been made at $2.30 and up to $2.50 at oven. Foundry coke has been less active, with sales at $3 to $3.15. For delivery in buyers' yards in this vicinity prices range about as follows per net ton:

Connellsville furnace coke	$4.25 to $4.65
Connellsville foundry coke	4.90 to 5.35
Mountain furnace coke	4.00 to 4.25
Mountain foundry coke	4.50 to 4.75

Bars.—Little new business has come out in either iron or steel bars. Ordinary iron bars show a rather wide range of prices, as low as 1.25c. mill being reported, although reasonable orders are quotable at 1.37½c. to 1.42½c. delivered in this vicinity. For the better grades higher prices are readily obtained. Steel bars are in moderate demand at 1.55c. delivered.

Cincinnati

CINCINNATI, OHIO, September 3, 1913.—(*By Telegraph.*)

Pig Iron.—Prices are firmer on both Northern and Southern foundry iron and there is a much better inquiry. The majority of prospective buyers are of the class that ordinarily purchases from 100 to 500 tons at a time, and the interest that these users of iron are taking in the market at the present time indicates a brighter future. There is considerable business under negotiation with individual iron merchants that is not included in the general inquiries reported. While the Southern furnaces, as a rule, are refraining from quoting on next year's business, it is generally understood that $11.25 for the first quarter and $11.50 for second quarter, Birmingham basis, are figures generally named by sellers who care to take orders for such delivery. The general inquiries out include one from an Indiana stove maker for 5000 tons of foundry iron, equally divided between Northern and Southern brands, for first half shipment. A central Ohio manufacturer is expected to purchase 2500 tons of foundry grades, the larger part of which will probably go to Southern producers. Approximately 2000 tons of Lake Superior charcoal iron was contracted for by two Michigan melters, and a manufacturer in the same territory booked 700 tons of Northern malleable, which is quoted at $14, Ironton, for this year's shipment. Two sales of 500 tons each have been made by Northern foundry iron producers. At the prevailing quotations, order books will soon be opened for next year's business, which action will doubtless bring out an additional number of inquiries. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.75 to $15.25
Southern coke, No. 2 foundry and 2 soft	14.25 to 14.75
Southern coke, No. 3 foundry	13.75 to 14.25
Southern, No. 4 foundry	13.25 to 13.50
Southern gray forge	12.75 to 13.25
Ohio silvery, 8 per cent. silicon	18.20 to 18.70
Southern Ohio coke, No. 1	16.20 to 16.70
Southern Ohio coke, No. 2	15.20 to 15.70
Southern Ohio coke, No. 3	14.95 to 15.45
Southern Ohio malleable Bessemer	15.20 to 15.45
Basic, Northern	15.20 to 15.45
Lake Superior charcoal	16.25 to 17.25
Standard Southern carwheel	27.25 to 27.75

(By Mail)

Coke.—There is a better demand for foundry coke, but only for prompt shipment. It is reported that prices have been shaded in the Wise County district, but $3 per net ton at oven is the average quotation in all three producing districts. Furnace grades are firm around $2.50 per net ton at oven Connellsville, although a few brands not considered up to the standard grade can probably be purchased under this figure for prompt shipment. Sales of both foundry and furnace coke are now rather limited, but the inquiry is much better, and it is stated that there will be some heavy contracting the present month for both furnace and foundry coke.

Finished Material.—The partial settlement of local labor troubles has favorably influenced the demand for structural material, including reinforcing concrete bars. However, business is not up to normal in many finished lines. Sheets, both plain and galvanized, show some improvement, and mill prices are maintained around 2.20c. for No. 28 black sheets and 3.20c. to 3.25c. for galvanized sheets, f.o.b. Pittsburgh. The local warehouse price of steel bars remains at 1.95c. and structural shapes at 2c. to 2.05c. a lb. Railroad track material is not in very good demand in this territory at the present time.

Old Material.—The market is weak, and a reduction of about 25c. a ton could probably be had on all grades of scrap material listed. However, the volume of business transacted is so light that present quotations are not changed. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton.

Bundled sheet scrap	$7.25 to $7.75
Old iron rails	12.25 to 12.75
Relaying rails, 50 lb. and up	19.75 to 20.25
Rerolling steel rails	11.25 to 11.75
Melting steel rails	9.50 to 10.00
Old carwheels	11.00 to 11.50

Per Net Ton.		
No. 1 railroad wrought	$9.25 to	$9.75
Cast borings	4.75 to	5.25
Steel turnings	4.75 to	5.25
No. 1 cast scrap	9.00 to	9.50
Burnt scrap	6.50 to	7.00
Old iron axles	16.75 to	17.25
Locomotive tires (smooth inside)	10.25 to	10.75
Pipes and flues	6.00 to	6.25
Malleable and steel scrap	7.50 to	8.00
Railroad tank and sheet scrap	4.75 to	5.25

Cleveland

CLEVELAND, OHIO, September 2, 1913.

Iron Ore.—Some shippers are behind in their schedule, not having been able to catch up since the labor troubles at the head of Lake Superior, and boats are still being delayed at Superior for cargoes. The movement in September and October will have to be very heavy to make up for time lost in August if the season's shipments are to reach expectations. Consumers generally are in no hurry for their ore, and a large part of that now being shipped is going into storage on the docks. We quote prices as follows: Old Range Bessemer, $4.40; Mesaba Bessemer, $4.15; Old Range non-Bessemer, $3.60; Mesaba non-Bessemer, $3.40.

Pig Iron.—While the market is not active, a fair volume of inquiry is coming out for foundry grades and prices are firm. In the Valley No. 2 foundry can no longer be had under $14 and several sellers are asking $14.25. In Cleveland $14.50 delivered continues to be the general market price for No. 2, although one interest which is asking $15 delivered, has been able to sell some small lots at that price. A large northern Ohio consumer has an inquiry out for a round tonnage of foundry and gray forge for first half delivery. Some sellers will ask an advance over last half prices for iron for delivery next year. The General Electric Company, whose inquiry for a round tonnage for its Erie and Eastern plants was noted last week, has not yet purchased this iron. Southern iron is firm at $11, Birmingham, for No. 2. Several small sales have been made at that price. For prompt shipment and for the last half we quote, delivered Cleveland, as follows:

Bessemer	$16.65
Basic	15.00
Northern No. 2 foundry	$14.50 to 15.00
Southern No. 2 foundry	15.35
Gray forge	14.25
Jackson County silvery, 8 per cent. silicon	18.55 to 19.05

Coke.—A local furnace company has been sounding the market on furnace coke for September shipment, but has been unable to secure any quotations on standard grades lower than $2.50. The foundry coke market is quiet but prices are firm. We quote standard Connellsville foundry coke at $3 to $3.20 per net ton at oven.

Finished Iron and Steel.—More new business in finished steel is being figured on in this market than for several weeks. This consists largely of structural material for railroad and highway bridge work. Several thousand tons are wanted for highway bridges in Ohio. August showed quite a satisfactory improvement over July in the amount of business, including specifications on contracts and new orders. Warehouse business also improved somewhat during the month. Steel bar specifications are good, and a fair amount of new business is coming out. Several implement makers placed steel bar contracts during the week at 1.40c., Pittsburgh. Practically all the implement makers of this territory are now covered with contracts. The demand for steel bars for reinforcing purposes continues active. Current orders for structural material have been somewhat light, but the outlook in building lines is promising. An inquiry is expected shortly for the steel for the Statler Hotel, Detroit. It is estimated that it will take about 6000 tons. An inquiry is out for 600 tons for an addition to the Taylor store in Cleveland. Local contractors are figuring on a new Federal building in New Haven, Conn., which will require 1000 tons. Shading of $1 per ton is reported on prices of plates, but only by some of the smaller mills. The demand for sheets is moderate. Minimum quotations appear to be 2.15c. for No. 28 black and 3.15c. for No. 28 galvanized. Rivet prices are unchanged at 1.90c., Pittsburgh, for structural and 2c. for boiler, but the market is weak and some makers are shading these quotations. The demand for bar iron is light and prices continue weak. We quote bar iron at 1.45c. Cleveland, for delivery in this territory. Wire prices are being well maintained and the demand has improved somewhat since the recent reduction in prices. The demand from coal mining companies for light rails is active. This is to be accounted for by the fact that the present season is a most satisfactory one for the soft coal operators. Warehouse prices are unchanged at 2c. for steel bars and 2.10c. for plates and structural material.

Old Material.—The market continues inactive, with no particular change in prices. While little buying is being done by consumers, the feeling prevails that there must be an improvement in the demand shortly, and some producers and dealers are holding their material, particularly busheling and heavy steel scrap, for higher prices. One local mill is taking all the heavy scrap that it can pick up at $11.25. A local sale of busheling is reported at $10.50. One of the local steel making plants is holding back on shipments and other consumers are taking shipments only in moderate quantities. Borings and turnings are very dull. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton.		
Old steel rails, rerolling	$13.00 to	$13.50
Old iron rails		14.00
Steel car axles	17.00 to	17.50
Heavy melting steel	11.25 to	11.50
Old carwheels	12.50 to	13.00
Relaying rails, 50 lb. and over	23.00 to	25.00
Agricultural malleable	10.00 to	10.50
Railroad malleable	11.00 to	11.50
Light bundled sheet scrap	8.00 to	8.50

Per Net Ton.		
Iron car axles	$20.00 to	$21.00
Cast borings	5.75 to	6.00
Iron and steel turnings and drillings	4.50 to	4.75
Steel axle turnings	7.00 to	7.50
No. 1 busheling	10.25 to	10.50
No. 1 railroad wrought	10.50 to	11.00
No. 1 cast	11.00 to	11.50
Stove plate	8.50 to	8.75
Bundled tin scrap	10.00 to	10.50

German Conditions Unsatisfactory

Raw Materials Relatively Higher than Finished Products—Steel Plate Prices Declining

BERLIN, August 21, 1913.

Last week's slight improvement in prices of bars has continued, but advances have been small, and on the whole the situation of the iron and steel market is unsatisfactory. An anomaly of the situation is pointed out in the annual report of the Meggen Rolling Mills, which complains that the prices maintained for raw products, such as pig iron, semi-finished material and coal, are out of all proportion to the prices quoted for its finished products. Steel bars, for example, are quoted in some localities at less than the quotations for the billets from which the bars are rolled.

A fair increase in orders for bars, especially from abroad, has raised prices to 99 marks ($23.56) f.o.b. Antwerp, net, against 98 marks ($23.32) last week. For urgent orders as high as 100 to 102 marks ($23.80 to $24.28) has been demanded and paid, and for certain specially rolled qualities, such, for instance, as those of Haspe, 103 to 104 marks ($24.51 to $24.75) has been obtained. Inquiries from Russia and America have increased, with a favorable effect on the home market. The Saar and Lorraine works quote net 92 to 93 marks ($21.90 to $22.13) f.o.b. Diedenhofen and 95 to 96 marks ($22.61 to $22.85) at Neunkirchen, while Rhenish-Westphalian products are held at 100 marks ($23.80). Specifications are coming along well.

Plate Prices Going Down

In contrast to the slight improvement in bars, plates have fallen off markedly. Heavy plates are quoted at 110 to 112 marks ($26.18 to $26.66), against 113 to 114 marks ($26.89 to $27.13) last week, and Essen reports sales of thin plates at 120 marks ($28.56), a loss of no less than 6 marks ($1.43) in the week. Smaller works in the Essen district have had to run on part time. Ship plates and locomotive material make up the greatest part of domestic specifications, but the threatening renewal of the strike in the shipyards at Kiel, Bremen and Stettin is an unfavorable factor here. The campaign for the formation of a heavy plate association is being carried on actively, but the chances for its organization are not considered favorable. The striking disproportion between prices for semi-finished products and thin plates leads to the restriction of production, especially by concerns producing only thin plates. The export business is hampered by the uncertain condition of the foreign markets and the constantly varying prices.

The firmness of the German coal market has not

been without a favorable result on the pig-iron market. Against generally lower prices abroad in July and the first part of August, domestic prices have been well maintained.

Details of a German Combine

Reports of a weakness in the band-iron market, which emanated from the Düsseldorf Bourse, are categorically denied by the association of Rhenish-Westphalian band-iron rolling mills. An element making for steadiness has been introduced into the cold-rolled band-iron market by the formation in Düsseldorf of a joint sales agency for packing box iron, which takes the place to some extent of the recently dissolved Verband Deutscher Kaltwalzwerke. The lion's share of the new association falls to the Gewerkschaft Deutscher Kaiser, with 52.5 per cent. Other members are, with their quotas, as follows: Böker & Röhr, Hohenlimburg, 16 per cent.; Weber & Giese, Hohenlimburg, 11.8 per cent.; United Rolling & Tube Works, Hohenlimburg, 9.1 per cent.; Iron & Steel Wire Works, Schwelm, Westphalia, 4 per cent.; Böcker & Haver, Hohenlimburg, 3.5 per cent.; Ernest Selve, Augustenthal, 1.9 per cent., and Associated Bierbach Wire Works, Altena, 1.2 per cent.

The pipe market is depressed and quiet. Roumania's imports for the petroleum fields have, of course, suffered from the Balkan war, and the high money rates have had the effect of inducing many municipalities to await a more favorable time for extending their water and sewerage systems.

The extraordinarily bad situation of the building industry has had its natural effect on structural shapes, rivets, etc. The Association of Rivet Manufacturers in Düsseldorf-Gerresheim gave notice Monday of a reduction of 5 marks ($1.19) per ton, effective immediately. This brings the price of rivets down to 165 marks ($39.27).

The improvement in bars has had a favorable effect on the Belgian market, although the situation there is still far from satisfactory. Prices in general have not advanced, but on the other hand they have not declined. The pig-iron market is quiet. Exportations of semi-finished products are fairly active and a satisfactory foreign demand for rails is noted. Bars for export have gained slightly, but the domestic consumers are still maintaining last week's reserve. Specifications all along the line are decreasing. The Belgian Steel Works Association has decided to maintain the domestic price of 165 francs ($31.85) per ton for beams until the end of the year.

St. Louis

ST. LOUIS, MO., September 1, 1913.

A reasonably steady buying movement is in progress in the pig-iron, finished product and coke markets, though the aggregate does not mount to high figures. The temper of the situation is fairly satisfactory, while prices are all well held, with the exception of the scrap market, where there is a tendency toward renewed pessimism, following embargoes in some degree upon contract shipments.

Pig Iron.—Buying the past week was for the most part in small lots, but these were quite numerous and well scattered, all being for early shipment and indicating that consumers are in immediate need of the iron. Shipments on contracts, too, continue to be insisted upon, with all information pointing to prompt melting and no marked accumulation of stocks. There is little disposition to put out inquiries for deliveries beyond the first of the year and less disposition on the part of the furnace representatives to make quotations therefor. The general impression is that hand-to-mouth buying is to be expected for some time to come. Among the sales were 1200 tons of Lake Superior charcoal iron, 500 tons of No. 2 Southern and 500 tons of No. 2 Northern. There was also a sale of 1000 tons of ferromanganese for delivery in last quarter. Inquiries remaining unfilled include one of 500 tons of Northern coke iron for early delivery; two of 300 tons of Northern foundry iron also for early delivery; 2000 tons of Northern basic for delivery this year and 600 tons of Northern basic for delivery in last quarter and also first quarter.

Coke.—Demand on contracts is active and shipments continue to be urged forward. For the most part the small-lot new business commands 15 to 25c. above the quotations on large lots. The recently settled lead strike in Missouri has interfered with the early fall contracts of the smelters, though these are likely to be closed reasonably soon. By-product coke is quoted on the Connellsvile basis.

Finished Iron and Steel.—New demand in structural material is about the same as in recent weeks, while requisitions on contracts are accompanied by unusual insistence upon shipment. Fabricating shops report enough ahead and in sight to remove any occasion for pessimism. The material contract for the new viaduct at Kansas City has been held up in a disagreement over the bond of the contractor. The Kansas City Terminal Company is expected to come into the market shortly for 600 to 800 tons of structural material. A commercial building at St. Louis, 600 to 800 tons, is to be refigured and reinforced concrete construction may be the result. In standard rails no transactions took place, while in light rails there was a slackening of demand. Ordinary bars and also reinforcing material were in somewhat lighter request. There has been a softening tendency in plates here among the smaller interests, but the chief figure in the field is holding prices up to the same figure as has prevailed for some time. The present lull is regarded merely as an incident, chiefly because material is going rapidly into consumption.

Old Material.—The recent bright spot in the scrap market has faded slightly and consumers are not taking as freely as in the past few weeks or as readily as they were expected to. Relaying rails are still in sharp demand at firm prices and the 800 tons of the St. Joseph & Grand Island closed the past week went at the highest prices known in a long time. The Missouri Pacific put out a list of 2000 tons, closing this week, and others are expected as usual at the first of the month. We quote dealers' prices, f.o.b. St. Louis, as follows:

Per Gross Ton.

Old iron rails	$11.50 to $12.00
Old steel rails, re-rolling	11.00 to 11.50
Old steel rails, less than 3 feet	10.00 to 10.50
Relaying rails, standard section, subject to inspection	23.50 to 24.50
Old carwheels	10.50 to 11.00
Heavy melting steel scrap	9.50 to 10.00
Shoveling steel	9.00 to 9.50
Frogs, switches and guards cut apart	9.50 to 10.00

Per Net Ton.

Iron fish plates	$11.00 to $11.50
Iron car axles	18.00 to 18.50
Steel car axles	14.00 to 14.50
Wrought arch bars and transoms	13.00 to 13.50
No. 1 railroad wrought	9.75 to 10.25
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	8.50 to 9.00
Steel couplers and knuckles	8.50 to 9.00
Locomotive tires, smooth	10.00 to 10.50
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	4.00 to 4.50
No. 1 busheling	8.50 to 9.00
No. 1 boilers, cut to sheets and rings	5.50 to 6.00
No. 1 cast scrap	9.00 to 9.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.75 to 7.25
Pipes and flues	6.25 to 6.75
Railroad sheet and tank scrap	5.00 to 5.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	5.00 to 5.50
Bundled sheet scrap	4.50 to 5.00

Birmingham

BIRMINGHAM, ALA., September 1, 1913.

Pig Iron.—With sales in August, the bulk booked in the last two weeks of the month, of anywhere between 150,000 and 200,000 tons of Alabama pig iron and the output still held to the lowered percentage of June and July, the Southern iron situation appears to be very strong. The Sloss-Sheffield Steel & Iron Company led in the August selling with a total of 75,000 tons booked. Another company sold about 25,000 tons. One concern having sold well into the remainder of the year is quoting $11.50. The company which sold a large tonnage of $10 iron some time ago is reported as being practically out of the market for some time to come. The pipe makers have been especially large buyers, the leading interest having purchased 50,000 tons in the past month, others following with purchases aggregating 20,000. Shipments are very heavy and accumulated stocks are being eaten into at a rapid pace, the car situation being all that is to be desired so far. Charcoal iron, with two furnaces in blast, is firm at $25. The Clifton brand of the Alabama Company is bringing $1 to $1.50 per ton over general foundry price, with a daily output of 140 tons, all of which is readily disposed of. There is no apparent disposition as yet to blow in additional stacks, with the exception of the new Woodward furnace, which will go in soon, the addition to the by-product coke plant having been completed. Probably not all the August business was sold

at a straight $11 level, but enough of it was thus booked to make that the firm minimum. We quote, per gross ton, at Birmingham district furnaces, the first figure being the minimum and the latter what is asked by the two interests which are well sold up, as follows:

No. 1 foundry and soft	$11.50 to $12.00
No. 2 foundry and soft	11.00 to 11.50
No. 3 foundry	10.50 to 11.00
No. 4 foundry	10.25 to 10.75
Gray forge	10.00 to 10.50
Basic	11.00 to 11.50
Charcoal	25.00

Coal and Coke.—Coal and coke have both been strong for several months, and continue so with a demand for practically maximum output. Prices for coke are firmer than they have been in several years. Quotations, per net ton, f.o.b. cars at oven, are as follows: Furnace coke, $3.50; foundry, $4 to $4.25. The latter has especially strengthened. Coal is commanding a higher price than at this time last year, with the demand increasing as autumn approaches and additional factories go into operation. High grades have been in active demand all the summer. Practically all mines are in operation and a maximum output is being made.

Cast-Iron Pipe.—The pipe shops are not reporting very favorable conditions. One well-posted manufacturer expressed himself as apprehensive for fall business. Small lots are the rule in orders. Gas pipe is selling freely. Shops are working at about the same capacity as in vogue the past several months and there are some accumulations. Two new plants will be ready for the fall trade. Quoted prices would be shaded for sizeable offerings. We quote, per net ton, as follows: 4-in., $22; 6-in. and upward, $20, with $1 added for gas pipe.

Old Material.—Encouraged by improvement in the pig-iron market the old material yards are beginning to take on stock. The run of business is not yet large, but there is a distinct feeling that it soon will be and the dealers are more optimistic. Light steel and cast scrap are the leading sellers. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old iron axles (light)	$15.00 to $15.50
Old steel axles (light)	15.00 to 15.50
Old iron rails	13.50 to 14.00
No. 1 railroad wrought	12.00 to 12.50
No. 2 railroad wrought	10.00 to 10.50
No. 1 country wrought	9.50 to 10.00
No. 2 country wrought	8.50 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	10.50 to 11.00
Tram carwheels	10.50 to 11.00
Standard carwheels	12.00 to 12.50
Light cast and stove plate	8.25 to 8.75

Boston

BOSTON, MASS., September 2, 1913.

Old Material.—The scrap market has improved to some extent and prices have slightly advanced all along the line. The mills are buying somewhat more freely than they have been, but a large improvement from this source is still possible. The quotations given below are based on prices offered by the large dealers to the producers and to the small deaers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points which take Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	$9.00 to $9.25
Low phosphorus steel	13.75 to 14.75
Old steel axles	13.75 to 14.75
Old iron axles	21.25 to 21.75
Mixed shafting	13.25 to 13.50
No. 1 wrought and soft steel	10.75 to 11.00
Skeleton (bundled)	7.75 to 8.25
Wrought-iron pipe	8.75 to 9.25
Cotton ties (bundled)	8.75 to 9.25
No. 2 light	3.75 to 4.25
Wrought turnings	5.50 to 5.75
Cast borings	5.50 to 5.75
Machinery, cast	11.75 to 12.25
Malleable	10.25 to 10.75
Stove plate	8.00 to 8.50
Grate bars	7.00 to 7.25
Cast-iron carwheels	13.75 to 14.25

San Francisco

SAN FRANCISCO, CAL., August 26, 1913.

Pacific coast merchants still persist in their attitude of extreme conservatism. While stocks in nearly all lines have been reduced to very small proportions, no general buying movement has yet appeared. Assortments are being maintained by frequent small purchases, but the consuming movement appears still to be greater than that from mill to merchant. Buyers generally are convinced that prices will find lower levels in the fall, and prefer to risk a possible shortage rather than buy at present. With increasing promptness in deliveries, however, there is no great apprehension of a shortage. Distributive business is quiet in San Francisco and Los Angeles, but the country trade holds up remarkably well, and from all precedents requirements should increase materially within the next 30 days.

Bars.—No very large business is coming up at present, though a renewal of local wharf construction may bring a better demand for reinforcing material. The latter finds a very fair general demand, preventing any large accumulation at local mills, though production is now pretty well up to r quirements. There is little new demand for soft steel bars in which the jobbing trade is normally light at this season. Several large buyers are well supplied with foreign bars, and specifications on contracts are rather closely limited. No further change has been made in prices, soft steel bars, in small lots from store, being quoted at 2.60c., and iron at 2.50c.

Structural Material.—No new business of any consequence has been closed in the last fortnight, though awards are expected at any time on the Hobart building and the Oakland Y. W. C. A. Bids will be opened September 4 for steel for the Horticultural Building of the Exposition, estimated at about 600 tons. Otherwise there is nothing of importance in the market, though a few small jobs are figuring and some fairly large work is being planned. Plans are under way for the Physicians' building, this city, and a 7-story Class A building, 100 x 103 ft., at Clay and Fifteenth streets, Oakland. Figures are being taken on a $65,000 I. O. O. F. building in Oakland. It is announced that nothing will be done on the proposed Spreckels building at Fourth and Market streets for at least a year. Milliken Bros. are making rapid progress in erecting the Clift hotel, in which a number of 80-ton girders were hoisted to a hight of 250 ft. Both local and Eastern fabricators are showing more than usual anxiety for new business.

Rails.—Excellent business is reported in Oregon and Washington, where numerous logging roads are making extensions, and several important inquiries are due in that territory in the fall. Some inquiry is reported from transcontinental roads in this territory, but the general movement in California continues light, interurban lines being unable to finance projected extensions as promptly as desired. San Francisco is at present voting on a bond issue for the construction of more municipal railroads.

Sheets.—The jobbing trade is seasonably quiet, but usually at this time merchants are preparing for the heavy fall demand for corrugated sheets. At present, however, the stock-reducing movement continues, most buyers refusing to take any interest in galvanized sheets in the belief that prices will be lower in the near future. Shipments can be had promptly, and no fear of a shortage is expressed. A few merchants have a fair tonnage left from former purchases, but supplies on the whole are light.

Plates.—Tank and pipe manufacturers are well occupied with old orders, some of them having work to last until next spring, and a moderate tonnage is continuously being specified. Some new business has also been booked of late, though the principal requirements for work in hand are well covered. Some new inquiries are coming up for penstock work, but it is not known whether riveted pipe or German welded pipe will be used. The Baker Iron Works has taken a contract for a lot of riveted pipe for Pasadena, Cal.

Standard Pipe.—Business in butt-weld pipe remains dormant, the only activity being in the country jobbing trade. Merchants are buying in small lots, barely enough to keep assortments complete, though there is only a moderate supply on hand. Resale prices have followed the downward movement at the mills. Oil-field business is quiet, but there is some inquiry in connection with waterworks. The town of Fort Bragg, Cal., is taking figures on 7 miles of 4 to 10-in. pipe, and the State is in the market for 96,000 ft. of dipped pipe and casings for work at Yountville.

Cast-Iron Pipe.—The only order of any importance placed lately was 1000 tons of 8-in. pipe for Portland, Ore. Small orders have been placed by Pasadena and

Redwood City, Cal., with the American Cast Iron Pipe Company, and the town of Long Beach is takings bids this week on 600 tons, but aside from this there is practically nothing in the market. The outlook for the fourth quarter is considered fairly good, but most of the business in prospect depends on the sale of bonds.

Pig Iron.—The increasing movement and firmer tendency in producing districts are bringing out a little more interest on the part of local foundrymen, and sales appear to have increased somewhat in the last few days, though so far there has been no large buying. The bulk of the business is in little more than carload lots for early shipment, though any pronounced upward movement will probaby bring out an active demand. Local quotations, which have lately been slightly above the Birmingham market, show practically no change, No. 1 Southern foundry and soft being held at $22.50 per gross ton. The West Coast Iron Company has started operations, and its product is being tested by local foundries, but it has not yet found an established place in the market.

Coke.—Local buyers have neglected Southern coke of late, and at present are buying little, as a comparatively large tonnage has been purchased to arrive. German Syndicate coke for fall loading is stiffening up, owing to shipping conditions, and is firm at $12.50 per gross ton. Foreign foundry coke for prompt delivery, ex yard, is quoted at $15 to $15.50 per net ton.

Old Material.—Cast-iron scrap has been in unusually strong demand of late, and No. 1 heavy machinery scrap which is scarce, has been sold as high as $20 per net ton. Ordinary offerings are quoted at $18 to $18.50 per net ton. The larger consumers of steel melting scrap have contracted for supplies for some time to come, and are steadily taking a fair tonnage, the price continuing at $12 per gross ton. Rerolling rails are again in demand, and are quoted at $16.50 to $17 per net ton. A few relaying rails have been sold around $35. Wrought scrap is quoted as before at $13 to $15 per net ton.

British Iron Trade Still Sluggish

Rail Inquiries from Australia and South Africa—Some Speculative Pig-Iron Buying

(*By Cable*)

LONDON, ENGLAND, September 3, 1913.

A little speculative activity has developed in Cleveland pig iron in anticipation of autumn buying, but no alteration is perceptible in the general situation. It is reported here that there are very large stocks of pig iron in Germany, chiefly No. 3 Luxemburg foundry. More inquiries are coming out for steel rails, including 30,000 tons for Victoria and 11,000 tons for South Africa. Stocks of pig iron in Connal's stores are now 186,919 gross tons, against 188,983 tons a week ago.

We quote as follows:

Cleveland pig-iron warrants (Tuesday), 55s. 10½d. ($13.59), against 54s. 6d. ($13.26) a week ago.

No. 3 Cleveland pig iron, makers' price f.o.b. Middlesbrough, 56s. 6d. ($13.75), against 55s. 3d. ($13.46) a week ago.

Ferromanganese, £10 11s. 9d. ($51.53), f.o.b. shipping port.

Steel sheet bars (Welsh), delivered at works in Swansea Valley, £4 15s. ($23.11).

German sheet bars, f.o.b. Antwerp, 87s. 6d. ($21.29).

German 2-in. billets, f.o.b. Antwerp, 80s. ($19.46).

German basic steel bars, f.o.b. Antwerp, £4 16s. to £4 17s. ($23.36 to $23.60).

Steel bars, export, f.o.b. Clyde, £6 12s. 6d. ($32.24).

Steel joists, 15-in., export f.o.b. Hull or Grimsby, £6 5s. ($30.42).

German joists, f.o.b. Antwerp, £5 8s. to £5 11s. ($26.28 to $27.01).

Steel ship plates, Scotch, delivered local yards, £7 15s. ($37.72).

Steel black sheets, No. 28, export f.o.b. Liverpool, £9 5s. ($45.02).

Steel rails, export f.o.b. works port, £6 10s. ($31.63), a decline of 2s. 6d. (61c.).

Tin plates, cokes, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 13s. 1½d. ($3.19).

(*By Mail*)

Little Iron Going Into Store—Sheet Bars Higher, but Lower Prices Expected on Finished Steel

LONDON, ENGLAND, August 23, 1913.

In spite of all that has been said, and talk on the subject has been very plentiful, the final decision of the Cleveland iron masters in respect to the warrant store problem is not yet known. The proposals to form a company on the lines indicated in my previous letters were abandoned, and it is hard to see what else could have happened; but the thing in the background now is whether the iron masters will abstain from using the warrant stores. If there is sufficient unanimity among them and they do so refuse, then the speculative market in Cleveland pig iron is near the end of its tether. Nobody knows. Very little metal is being put into store and some accumulation is said to be proceeding in makers' yards, while for the time being the bears are afraid to operate, lest by doing so they are caught and squeezed again, this time by the makers, whose commercial principles are apparently opposed to cornering tactics! However, there it is, and thanks to the fears of the bears the tone of the market has kept very steady to firm, the occasional fluctuations witnessed not amounting to anything important.

Negotiations for Alabama Iron

Pig iron from Alabama (No. 3 foundry) is now offered here in fairly good quantities and there is just a chance of a moderate-sized deal going through for the Lancashire district. Coke prices here are coming down, and yesterday 17s. 6d. was paid for delivery over the whole of 1914.

In half finished steel it is noted that the Germans have sold a few sheet bars this week at 87s. and 87s. 6d., but the demand is sluggish. The Belgians are out of the market altogether for sheet bars and are not anxious to sell blooms and billets. The French sellers have practically withdrawn from the market. Finished steel is dull and weak, and prices will have to go lower before buyers will be satisfied. The Continental position is being talked up by some people, but the huge falling off in the German Verband's July deliveries has startled the trade, for a reduction of 100,000 tons in a month is a long way more than had been expected.

The Welsh tin plate manufacturers who have been much disturbed and who are still greatly exercised in their minds by the continued competition of United States mills in Canada, which they regard as a Welsh preserve, recently approached our Government authorities but received cold comfort, on the ground that the matter was a political one in which the home Government could not interfere. I understand now that a deputation of Welsh tin plate makers is to visit Canada to put forward representations to the Canadian Minister of Customs regarding the alleged unfair competition to which they are subjected by the Steel Corporation. The deputation will also make representations to the Canadian Pacific Railway, whose vessels carry Welsh tin plates to Canada, and which also suffers from the American competition.

Buffalo

BUFFALO, N. Y., September 2, 1913.

Pig Iron.—The market shows continued indications of improvement in demand and of a firming up in price schedules. Some producers are now asking $14.50 at furnace for No. 2 with suggestion of a gradual further stiffening, and one furnace interest is quoting $14.75 to $15 for No. 1 and $14.50 to $14.75 for No. 2 X foundry. The aggregate placed for the week so far as reported is about 10,000 tons of all grades, with inquiry under negotiation for about 8000 or 10,000 tons. From the producers' point of view the situation exhibits features of greater strength with a reasonable expectation that business will show increasing activity over the fourth quarter of the year. We quote as follows f.o.b. furnace for delivery covering remainder of the year, prices for city delivery being 25c. per ton higher:

No. 1 foundry	$14.25 to $14.50
No. 2 X foundry	14.00 to 14.25
No. 2 plain	14.00
No. 3 foundry	13.75 to 14.00
Gray forge	13.75
Malleable	14.00 to 14.50
Basic	14.25 to 14.50
Charcoal (regular brands)	15.75 to 16.75
Charcoal, special brands and analysis	17.00 to 20.00

Finished Iron and Steel.—A large number of small inquiries are being received asking quick delivery. Better demand for wire products is noted, prices of $1.45 and $1.65, base, continuing to prevail on wire and wire nails, respectively. Fairly good demand is also noted in track supplies and railway material. Taking it as a whole the total of actual business placed in August was in excess of June or July in all lines of finished products. Structural steel fabricators are all busy, but largely on work taken some time ago, the only new work materializing during the week being scattered small jobs. The Charles F. Ernst Sons Iron Works has taken contracts for steel for a refrigerator building for the Magnus Beck Brewing Company and for a storage and stable building for the Wm. Simon Brewing Company, Buffalo, about 150 tons each. Bids are to be received next week for structural steel on revised plans for a school and social center building to be erected by the Notre Dame des Lourdes church and for a club house for the Order of the Eagles, Buffalo, each requiring a small tonnage, and steel for a bottling works for the Ziegler Brewing Company, Buffalo, 100 tons.

Old Material.—As was the case last week, the principal activity noted is in borings and turnings. In other lines consumers are conservative, only buying in small amounts for immediate consumption requirements and not contracting for forward delivery. Notwithstanding this conservatism in buying, prices are stiffly held by dealers, who believe a higher level will soon be dominant. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$11.00 to $11.50
Boiler plate, sheared	12.50 to 13.25
Bundled sheet scrap	8.00 to 8.50
No. 1 busheling scrap	10.50 to 11.00
No. 2 busheling scrap	8.00 to 8.50
Low phosphorus steel scrap	16.50 to 17.00
Iron rails	15.00 to 15.50
No. 1 railroad wrought	13.00 to 13.50
No. 1 railroad and machinery cast scrap	13.00 to 13.50
Steel axles	17.00 to 17.50
Iron axles	22.50 to 23.00
Carwheels	13.00 to 13.50
Railroad malleable	12.00 to 12.50
Locomotive grate bars	10.00 to 10.50
Stove plate (net ton)	9.75 to 10.00
Wrought pipe	9.50 to 10.00
Machine turnings	6.00 to 6.50
Heavy steel axle turnings	8.00 to 8.75
Clean cast borings	6.25 to 6.75
Bundled tin scrap	14.00

New York

NEW YORK, September 3, 1913.

Pig Iron.—The largest new inquiry in the East in the past week is for 2000 tons of iron for a Connecticut foundry, a portion of the deliveries extending beyond January 1. Other Connecticut inquiry amounts to several hundred tons. The purchase of 1500 tons for a Paterson, N. J., foundry making plumbers' goods will probably be completed this week. A 500-ton purchase by a Hudson River foundry is also still pending. For the most part the business now up is of the small-lot variety, deliveries being confined to this year. Furnace companies in eastern Pennsylvania are rather firmer in their views, and as high as $15.75 at furnace has been done on small orders for No. 2 X iron, though $15.25 iron is still in evidence. The $15, delivered, basic iron recently sold by four furnace companies in the Lehigh and Schuylkill Valleys gave unexpected indication of anxiety on the part of some producers to get round-lot tonnage. It is perhaps fair to say that these sellers are now unwilling to entertain such a price. Several Buffalo furnaces are in the position of needing very little more business to book them up into December. Such are more ant to ask $14.25 at furnace for No. 2 X than $14. The General Electric Company, it is understood, has closed for a considerable part of its recent inquiry for 6000 tons foundry iron for delivery at Lynn, Pittsfield, Schenectady and Erie. We continue to quote Northern iron for tidewater delivery as follows: No. 1 foundry, $15.75 to $16; No. 2 X, $15.50 to $15.75; No. 2 plain, $15.25 to $15.50. Southern iron is quoted at $15.50 to $16 for No. 1 foundry and $15 to $15.50 for No. 2.

Structural Material.—The market has been marking time, as indicated by the scarcity both of lettings and inquiries. The dullness naturally has not helped to stiffen prices and it is agreed that 50 tons may be obtained at 1.40c., Pittsburgh. Inquiries have been made for about 5000 tons of structural material and reinforcing bars for harbor improvements at Toronto, and bids are to be taken September 10 for a large tonnage of steel piling for the Lincoln Memorial at Washington. About the only other work which has come to light is 700 to 800 tons for what is substantially an approach for the second story of the Commonwealth pier at Boston; 500 tons for the South Carolina Western (Seaboard Air Line), and 500 to 600 tons for Philadelphia & Reading grade crossings in Philadelphia. About the only awards are 400 tons for terminal area work. New York Central, to Lewis F. Shoemaker & Co., and 200 tons for a draw span at Wilmington, Del., to the Pennsylvania Steel Company. We quote mill shipments of plain material at 1.40c., base, Pittsburgh, or 1.56c., New York, although some of the larger companies are holding at 1.45c., base, Pittsburgh. Prices from store are 2.10c. to 2.15c.

Plates.—There seems to be little doubt about 1.40c., base, Pittsburgh, being the market for large size contracts for delivery this year. An effort by one buyer to secure 1.37½c., Pittsburgh, on promises of heavy specifications against the contract has failed with at least two mills, and in one case the contract has been made at 1.40c. for delivery this year. Prompt shipments of plates can be obtained quite widely. In the car buying field, the New Haven is still in the market for 170 passenger cars, although 100 were recently bought. We quote plates at 1.56c. to 1.66c., New York, depending on the size of the order and the urgency of shipment, and, in the case of the lowest quotation, on the mill.

Bars.—The absence of new demand and of generous specifications on contracts are showing in bettered deliveries obtainable. Dullness also pervades the bar iron market. We quote mill shipments for steel bars at 1.66c., New York, and shipments from store at 2c. to 2.05c. and bar iron, mill shipments, at 1.40c. to 1.45c., New York, and from store 2.05c. to 2.10c.

Ferroalloys.—The situation is without change, with the makers' quotation at $56, Baltimore, though a shaded price might be obtained in some quarters. Inquiries total about 300 or 400 tons, almost entirely in small lots. Buyers are slow. Ferrosilicon is unchanged at $75, Pittsburgh, for carloads; $74 for 100 tons, and $73 for 600 tons and over. Buying is steady, though not of large proportions.

Cast-Iron Pipe.—It is expected that a date will be fixed this week for the opening of bids on the great contract for flexible joint pipe for the extension of the Catskill water supply to Staten Island. The trade has been expecting this for a long time, and in the present condition of the pipe industry competition is likely to be sharp. Nothing of special interest has developed in private buying, and municipal lettings in sight are few and small. Prices of carload lots of 6-in. continue at $23 to $24 per net ton, tidewater, New York.

Old Material.—The week has been exceedingly dull, no branch of the consuming trade showing any special interest in the old material market. Dealers' quotations, which are nominal, are as follows, per gross ton, New York:

Old girder and T rails for melting	$9.00 to $9.50
Heavy melting steel scrap	9.00 to 9.50
Relaying rails	21.50 to 22.00
Rerolling rails	12.50 to 13.00
Iron car axles	21.00 to 21.50
Steel car axles	14.50 to 15.00
No. 1 railroad wrought	11.75 to 12.25
Wrought-iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.50 to 5.00
Cast borings	5.25 to 5.75
Wrought turnings	4.50 to 5.00
Wrought pipe	8.75 to 9.25
Carwheels	12.50 to 13.00
No. 1 heavy cast, broken up	10.75 to 11.25
Stove plate	8.00 to 8.50
Locomotive grate bars	7.50 to 8.00
Malleable cast	9.00 to 9.50

Metal Market

NEW YORK, September 3, 1913.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Aug.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
28	16.12½	15.75	43.60	4.75	4.67½	5.90	5.75
29	16.12½	15.87½	42.80	4.75	4.67½	5.90	5.75
30	16.12½	16.00	.....	4.75	4.67½	5.90	5.75
Sept.							
2	16.25	16.12½	43.05	4.75	4.67½	5.90	5.75
3	16.25	16.12½	43.35	4.75	4.67½	5.90	5.75

Copper is higher, principally because of European influences. Some fair business has been done in tin and it has advanced. Lead quotations are unchanged,

but there is a tendency toward weakness. A slightly softer tendency is noted in spelter, but quotations are unchanged. The antimony situation is without change.

New York

Copper.—The market has been steadily gaining in strength and to-day, 16.25c., cash, is the quotation for Lake and 16.12½c., cash, for electrolytic. The increased firmness is largely due to higher prices which have prevailed abroad for both standard copper and best selected metal. At the same time there is an increased amount of domestic inquiry and some business has been done though the latter has not reached large proportions. The strike situation in the Lake Superior region is still a factor, though it is clearing up slowly with non-union help. The quotation in London to-day is £72 2s. 6d. for spot and £72 for futures. The total exports in August were 34,722 tons. The total exports for eight months this year show an increase of 29,726 tons as compared with the same period of last year. The figures for this year are 258,454 tons.

Copper Averages.—The Waterbury average for August was 15.62½c. The average New York price for Lake, based on daily quotations in *The Iron Age*, was 15.86c., and for electrolytic, 15.58c.

Pig Tin.—In the latter part of last week there was a fair amount of business, but since then the market has been quiet. In the buying referred to, both dealers and consumers took metal which was offered by London in limited quantities and at advancing prices. Most of the sales were for nearby deliveries and early shipments from Europe. Deliveries into consumption in August were good, amounting to 3600 tons. The total deliveries since January, 1913, were 31,200 tons, a decrease of 2500 tons as compared with the same time last year. The total visible supply August 31, 1913, was 11,261 tons, which is 24 tons below that of August 31, 1912. The New York quotation to-day is 43.35c., while those in London are £196 10s. for spot and £195 15s. for futures. The arrivals this month are 677 tons, and there is afloat 2235 tons. In stocks and landing August 31 was 1408 tons.

Lead.—While quotations have held at 4.75c., New York, and 4.67½c., St. Louis, the market is a trifle easier as the result of the settlement of the strike in the lead mining district. The latter part of last week the miners concluded that they would waive recognition of their union, accept 25c. a day increase in wages and return to work. Their action changed the aspect of the entire lead situation, although trouble in production will be experienced for two or three weeks at some of the mines because of water which has accumulated in them and which must be pumped out.

Old Metals.—The market continues firm without any change in dealers' selling prices, which are as follows:

	Cents per lb.
Copper, heavy and crucible	15.00 to 15.50
Copper, heavy and wire	14.50 to 15.00
Copper, light and bottoms	13.50 to 13.75
Brass, heavy	9.75 to 10.00
Brass, light	8.25 to 8.50
Heavy machine composition	13.25 to 13.50
Clean brass turnings	8.75 to 9.00
Composition turnings	12.00 to 12.50
Lead, heavy	4.50
Lead, tea	4.25
Zinc scrap	4.50

Spelter.—Although the brass mills have taken some fair quantities of high grade metal, spelter generally has not been active and in a jobbing way, particularly, is quiet. Quotations are unchanged at 5.90c., New York, and 5.75c., St. Louis, for prompt shipment. The tendency is toward an easier market.

Antimony.—No change has come to alter the listless state of this metal. The range of prices continues at 7.75c. to 8c. for Hallett's, 8.35c. to 8.40c. for Cookson's and 7.37½c. to 7.62½c. for Chinese and Hungarian grades. Arrivals are heavy, but the bulk of the new metal is being added to the already large stores in bonded warehouses.

Chicago

SEPTEMBER 2.—Orders of satisfactory volume continue to be had in metals in this market. While no especially heavy sales are reported, the market is strong with a general expectation of further advances, and a general buying movement is thus stimulated. We quote as follows: Casting copper, 16c.; Lake, 16.37½c., for prompt shipment; small lots ¼c. to ⅜c. higher; pig tin, carloads, 43½c.; small lots, 45½c.; lead, desilverized, 4.70c. to 4.75c.; corroding, 4.95c. to 5c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.85c.; Cookson's antimony, 10.50c., and other grades, 9.75c., in small lots; sheet zinc, $7.75, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount in carloads of 600-lb. casks. Old metals are quiet with a firm market. An increase of orders is reported, though no volume of any proportions was attained. We quote buying prices for less than carload lots: Copper wire, crucible shapes, 13.50c.; copper bottoms, 12.50c.; copper clips, 13c.; red brass, 12.50c.; yellow brass, 9c.; lead pipe, 4c.; zinc, 4.25c.; pewter, No. 1, 26c.; tinfoil, 32.50c.; block tin pipe, 36c.

St. Louis

SEPTEMBER 1.—Metals held quite firmly the past week with only slight fluctuations, but the transactions, while quite large, were not of the volume prevailing previously. Lead closed at 4.75c.; spelter, 5.75c. to 5.85c.; tin, 42.95c. to 43.15c.; Lake copper, 16.60c. to 16.85c.; electrolytic copper, 16.35c. to 16.47½c.; Cookson's antimony, 8.75c. to 8.85c. In the Joplin ore market there was some continuance of the activity of the previous week. Production is increasing. The basis range for zinc blende, 40 per cent., was $48 to $50 per ton, while the top for the choicest was $53 higher than has been the case since very early in the year. Calamine sold for $23 to $24 on 40 per cent. basis, with the choicest lots at $30. The demand for lead ore was good and the price for 80 per cent. was strong at $58. On miscellaneous scrap metals we quote as follows: Light brass, 5.50c.; heavy brass and light copper, 10c.; heavy copper and copper wire, 11.50c.; pewter, 24c.; tinfoil, 30c.; zinc, 2.75c.; lead, 3c.; tea lead, 2.75c.

Iron and Industrial Stocks

NEW YORK, September 3, 1913.

All exchanges were closed on Saturday and Monday. The shortened week was marked by increased activity and higher prices, due to the more cheerful view taken of the Mexican situation. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Am. Can, com.	33⅞- 35⅜	Railway Spring, com.	25½- 26¼
Am. Can, pref.	95⅞- 98	Railway Spring, pref.	97
Am. Car & Fdy., com.	46½- 46¾	Republic, com.	23½- 25
Am. Car & Fdy., pref.	115¼	Republic, pref.	88
Am. Loco., com.	35⅛- 36	Rumely Co., com.	18 - 20¼
Am. Loco., pref.	101¾	Rumely Co., pref.	44 - 48½
Am. Steel Foundries	31¾- 31⅞	Sloss, com.	29¼- 31
Bald. Loco., com.	45 - 45½	Pipe, com.	11½
Beth. Steel, com.	34 - 36¾	Pipe, pref.	48
Beth. Steel, pref.	72 - 73	U. S. Steel, com.	62¾- 65⅞
Colorado Fuel	31¼- 33	U. S. Steel, pref.	107⅜-108½
Deere & Co., pref.	94⅞- 95	Westinghouse Elec.	72 - 73½
General Electric	145¼-146	Chic. Pneu. Tool	51½- 53
Gr. N. Ore Cert.	35 - 35½	Cambria Steel	46 - 46½
Int. Harv., com.	108	Lake Sup. Corp.	26¼- 26¾
Int. Pump, pref.	26 - 27	Crucible Steel, com.	15⅞- 16½
Lackawanna Steel	37¾- 38	Crucible Steel, pref.	93 - 93½
Nat. En. & St., com.	14	Harb. Walk. Ref., com.	48
Pittsburgh Steel, pref.	93	La Belle Iron, com.	48
Pressed Steel, com.	25 - 25⅛		

Dividends Declared

The La Belle Iron Works, regular quarterly, 2 per cent. on the preferred stock, payable September 30, and ½ of 1 per cent. on the common stock, payable October 31.

The Railway Steel Spring Company, regular quarterly, 1¾ per cent. on the preferred stock, payable September 20.

A meeting is to be held in Worcester, Mass., October 10, of the American Society of Mechanical Engineers. Prof. David L. Gallup is to present a paper on "Experiments with Aeroplane Propellers" and another paper, scheduled to be presented in the administration building of the Norton Company, covers modern abrasives, their manufacture and use, by Aldus C. Higgins, George Jeppson and Charles H. Norton. It is expected that Boston members of the society will participate.

A gun lathe and boring machine with centers 55 in. high and a length of 67½ ft. between centers and arranged for surfacing, screw cutting, grinding, boring and chamfering guns has been built by Sir W. G. Armstrong, Whitworth & Co., Ltd., at their Openshaw works, Manchester, England. The length of the bed is 96 ft. 5½ in.; the width, 85 in.; the diameter of the face plate, 110 in., and the weight of the machine, 255 tons.

F. Felkel & Sons, Pittsburgh, Pa., architects and engineers, specializing in foundries, steel casting plants, etc., have opened an office in the Marshall Building, corner Public square and Superior avenue, Cleveland, Ohio.

Pig-Iron Consumers Pay Too Slowly

Furnaces Complain of Slow Collections —Must Pay Their Own Bills Promptly

BY A FURNACEMAN.

At the present time there is general complaint, and which is usually well founded, in regard to the slowness collections. It may be interesting to present, as secured a selling company's ledgers, an exact statement of e experiences this year in the matter of collections. e, for example, the subjoined list of shipments made furnace company to various customers scattered over Middle West. These shipments were all made in May, according to contract everyone was due exactly 30 s from date of shipment; that is, shipment made on 1 was due and should have been paid for on June 1.

es of May shments	Date of settlements
	June 27
	July 15
3, 5	June 18, 19, 21
9, 12, 14, 16, 20	June 27
	June 19, July 17
12, 21, 23, 30	June 12, July 8
	June 30
(This included four March shipments, so the settlement is not as good as it looks)	June 23
26	July 11, July 5
	July 19
7, 13, 15	June 11, June 23
17	June 26
	June 12
(This settlement included shipments of April 16, 20, 24)	June 16
31	July 2
12, 13, 19, 24, 25, 26, 27	August 23
	June 5
	July 8
30	Not yet paid
	Not yet paid
	July 3
3, 31	July 11
	August 10
	Not yet paid
	July 11
18, 19	August 2
19	July 28
29	Not yet paid
	June 30
	June 21
	July 1
	July 5
	July 5
23	June 25
	June 16
4	July 5
4, 25, 26	July 14
	July 7
	July 14
	July 25
	Not yet paid
	July 5
7, 28, 29	June 27, June 30
7, 29	July 28
8	Not yet paid

This statement shows that few customers have actually settled on the dot. There are one or two who settled before the account was due, but the overwhelming majority "hunched" and took an extra week or so; others took a full 30 days, while in a few instances the May accounts have not yet been paid.

To be exact, here is a record of 86 different shipments of pig iron, for which only nine customers settled exactly on the dot, or practically so. Two customers out of the 86 anticipated payment, each of them by seven days. The customer who had the largest number of shipments took by average date more than 60 days in paying his bills. Five of the customers had not settled on August 25. There are 45 different customers in this list, and of course every dollar was due some time in June, yet only 15 June remittances are to be noted.

Under these circumstances the furnace company must often find its financing difficult. It has no such latitude in the matter of paying its bills as its customers take to themselves. Its freights on raw materials, its payrolls and its coke and ore bills are all due and must be paid at certain fixed times. Doubtless, many slow remittances for pig iron are due to carelessness. The customer is perfectly good and has the money, but he does not appreciate the hardship which he is imposing on the furnace company by not settling according to contract. Further, he does not realize that often he is calling his own credit into question.

New Tools and Appliances

This is essentially a news department for which information is invited.

Transveyor Release Check.—To enable the operator to release the load independently of the handle, the Cowan Truck Company, Holyoke, Mass., has designed a release check for its transveyor. This permits the heaviest load to be lowered without shock or jar and the transveyor to be operated with one less motion than formerly. Heretofore pulling down the handle elevated the load and automatically locked it in place, and lowering the load was accomplished by holding the handle in the horizontal position, stepping on the foot pedal and gradually raising the handle back to the vertical position, the descent of the load being in proportion to the rate of travel of the handle. With the addition of the release check, the operation of the transveyor has been simplified, as in lowering the load it is only necessary to step on the foot pedal, the handle not being used in any way.

Controller Parts Cabinet.—For the convenience of engineers and all who are responsible for elevator maintenance, the Otis Elevator Company, Eleventh avenue and Twenty-sixth street, New York City, has designed a compact steel box, which contains the essential parts of the type of controller furnished with the elevator machine installed. By hanging one of these cabinets in the engine room, it is possible to replace a worn part of the controller instantly, and the elevator service will not be either impaired or interfered with. For convenience in ordering duplicate parts to replace those used in making repairs, or for securing additional ones, a catalogue is placed in a pocket on the inside of the cover. These cabinets are manufactured for direct-current controllers only and can be furnished for all the types of controllers used with the company's standard drum and traction machines of all voltages.

Book Review

The Practical Metallography of Iron and Steel. By John S. G. Primrose. Page 129, 5½ x 8½ in., flexible cloth. Published by Scientific Publishing Company, Manchester, England. Price, 3s.

Most text books dealing with the science of metallography are rather costly for the average student and there has been a decided lack of a concise book containing something more than the rudiments, and not too much detail. This little book supplies this need. It consists of a few revised chapters from Professor Sexton's book on the Metallurgy of Iron and Steel and augmented in several places by valuable suggestions by Dr. J. E. Stead. Besides three chapters dealing with the microstructure, the constitution and the heat treatment of iron and steel, there is a valuable and instructive one on micrographic examination of failures. The book contains practically all that is essential to the student of metallography.

Tests of Bessemer and Open-Hearth Rails.—A. J. Beaton, assistant to the engineer-in-chief of the South African Railways, in a pamphlet on "The Problem of the Steel Rail" refers to an advanced step taken on that system by introducing rails of different chemical compositions for use on curves of sharp radius and heavy wear. The rails used are as follows: Sandberg open-hearth high silicon; Sandberg Bessemer acid, high carbon; open-hearth basic, high carbon; Talbot open-hearth basic, high carbon; Bessemer acid: Bessemer basic. These rails are to be carefully weighed each year while the actual tonnage passing over them will be systematically recorded. The object is to determine the best type of rail, as well as to decide what curvature is consistent with the most economic alignment of track.

Personal

E. E. Slick, vice-president and general manager of the Cambria Steel Company, Johnstown, Pa., announces that Joseph A. McDonald, for some years assistant general superintendent of the Ohio works of the Carnegie Steel Company at Youngstown, Ohio, has been made general superintendent of the Cambria department of the Cambria Steel Company. Mr. McDonald has been filling this position since he went with the Cambria Steel Company last January, but had no title. Warren W. Worthington has been made general superintendent of the Gautier department.

Charles M. Pepper, for eight years the Government's foreign trade expert, has resigned his important post in the State Department at Washington, though urged by the new administration to remain in office. He will make a South American trip of several months for a study of developments in the trade of the United States likely to follow the opening of the Panama Canal. Readers of *The Iron Age* will have the benefit of Mr. Pepper's observations on matters pertaining to the iron and steel and machinery trades in a series of articles that will be published within the next six months. Mr. Pepper's work for the extension of the trade of American manufacturers is well known to many in the iron and steel industries. For three years previous to his connection with the State Department he traveled in many countries, submitting reports and monographs of an economic and commercial character to the Department of Commerce. He was sent to Europe by the Government in 1908 to make special investigation in view of the approaching revision of the tariff. In 1910 he was one of the special commissioners designated by President Taft to negotiate the reciprocity agreement with Canada.

J. Tatnall Lea, Philadelphia, Pa., has resigned as vice-president and director of the Lake Superior Corporation, to take effect on or about October 1. His duties as president of the First National Bank and his other business activities occupy his whole time. He endeavored to retire from the Lake Superior Corporation two years ago but circumstances forbade it. His connection with the corporation covers the period of its depression and recovery to a substantial and promising business enterprise.

Lewis R. Palmer, who has been representing the Osborn Mfg. Company, foundry supplies, Cleveland, Ohio, in the Philadelphia territory, has severed his connection with that concern and become affiliated with the sales forces of the Herman Pneumatic Machinery Company, Zelienople, Pa., manufacturer of molding machines.

Samuel F. Nuttall has been appointed purchasing agent for the Henry Vogt Machine Company, Louisville, Ky. He had been acting in that capacity for the local branch of the United States Cast Iron Pipe & Foundry Company. He succeeds to the position heretofore held by Guy Ellis, who in turn becomes sales manager for the ice machine department, succeeding H. E. Barrett, who resigned recently.

W. H. Caskey, who has been manager of the Industrial Car Company, Cleveland, Ohio, for nearly 14 years, has become sales manager of the Federal Steel Sales Company, Leader-News Building, Cleveland. The latter company is sales representative in northern Ohio for the Newport Rolling Mill Company and the Brightman Mfg. Company, and has also recently been appointed sales representative in Cleveland and vicinity for the Fred Medart Mfg. Company, St. Louis, Mo., manufacturer of steel lockers and metal shelving.

James L. Bennett has been appointed purchasing agent of the Central of Georgia Railway Company, with office at Savannah, Ga., vice Albert C. Mann, resigned to accept service with another company. William D. Stokes succeeds Mr. Bennett as general storekeeper, also with office at Savannah.

B. J. Ross, formerly manager of the Jones & Laughlin Steel Company's tin plate department, Aliquippa, Pa., has been appointed manager of the Clarksburg plant of the Phillips Sheet & Tin Plate Company, at Clarksburg, W. Va., effective August 1. He has had charge of the tin plate operation at Aliquippa since the plant was built at that place, and prior to that for many years was identified with the American Sheet & Tin Plate Company, at New Castle, Pa., and has had a long experience in the manufacture of tin plate.

Charles Segert, formerly with the Jones & Laughlin Steel Company, Pittsburgh, has been appointed superintendent of the new open-hearth plant of the Brier Hill Steel Company at Youngstown, Ohio.

William J. Doorley has been made general manager of the Scottdale Machine & Mfg. Company, Scottdale, Pa., succeeding E. A. Humphries.

Philip Fosdick, president Cincinnati Gear Company, Cincinnati, Ohio, has returned from a European tour, most of his time having been spent in Germany.

F. A. Geier, president Cincinnati Milling Machine Company, Cincinnati, Ohio, is enjoying a vacation in northern Michigan and Canada.

Dr. Lloyd Noland contributes an illustrated article to the July Bulletin of the American Iron and Steel Institute on "Bath Houses in the Iron and Steel Industry of Alabama." Dr. Noland, who for eight years was connected with the medical and sanitary work of the Isthmian Canal Commission, is now superintendent of the health department of the Tennessee Coal, Iron & Railroad Company.

Marcus L. Filley, 30 Church street, New York, Eastern sales representative of the DeForest Sheet & Tin Plate Company, has returned after a month's vacation at Schroon Lake, in the Adirondacks. It will be of interest to the sheet steel trade to learn of the extensive use of galvanized corrugated sheets through northern New York, on farm houses and barns. Mr. Filley states that fully 25 per cent. of the old buildings through the lake section are now roofed with corrugated sheets and V-crimped roofing, this material being put on directly over the shingles, without removing them.

M. F. Ryan, for 10 years connected with the Pittsburgh Spring & Steel Company, Farmers' Bank Building, Pittsburgh, has been appointed general Western sales agent of that company, with offices in rooms 1411-1413 Fisher Building, Chicago. He succeeds L. C. Noble, deceased.

B. F. Bourne, president Bourne-Fuller Company, Cleveland, Ohio, arrived home September 3 from a European tour.

Machinists and the Eight-Hour Day

John D. Hibbard, commissioner of the National Metal Trades Association, in the last issue of the Bulletin of that organization, calls attention to efforts that are being made by the International Association of Machinists to increase its membership with a view of making a move for a universal eight-hour day. At a recent meeting of the machinists' general executive board an organization department was established in charge of the vice-president, P. J. Conlon. In a circular letter to the various business agents of the International Association, Mr. Conlon states that efforts to secure a universal eight-hour day will not be made until the association has 100,000 members. Therefore it will be necessary to secure 25,000 additional members within the next year if it is to make the campaign in 1914, as is its present intention. Mr. Conlon says that local efforts to secure the eight-hour day had not been satisfactory and that such efforts must be universal and simultaneous to be successful. The Bulletin reprints a financial statement of the International Association of Machinists which shows that its finances are in poor condition, its liabilities over assets being $18,004.

Coke Oven Gas for Town Lighting.—According to the London Times, the recent movement in the direction of cheap gas is making considerable advances on the continent by the employment of waste gases from coke ovens which can be turned into the town mains. Liège, Belgium, is to purchase for illuminating purposes the surplus gas from the Société des Fours a Coke du Nord, at Hoboken, on terms that work out at about 7½d. per 1000 cu. ft., while at Verviers a contract has been made for coke oven gas for the supply of the town at 9¾d. per 1000 cu. ft. In England this source of supply has not met with much favor, though a district council in South Wales has been offered coke oven gas at 7½d. per 1000 cu. ft. Middlesbrough has arranged to take what it needs from a nearby source.

Obituary

Jennings S. Cox, Jr.

Jennings S. Cox, Jr., died in New York City Sunday, August 31, at the age of 47 years, of a complication of troubles due directly to heart disease. He was a widely known mining and metallurgical engineer, and for the last 18 years had been general manager of the Spanish-American Iron Company mines and other mining properties of the Pennsylvania Steel Company in Cuba. He graduated from the School of Mines of Columbia University in 1887, receiving the degree of metallurgical engineer. His first work was on the Harlem River Ship Canal, after which he was connected with the Carnegie Steel Company at Homestead, Pa., for a short time. He then took charge of John D. Rockefeller's Monte Cristo mine in Washington, and from there went to Ironwood, Mich., where he came in contact with Charles F. Rand and thus became connected with the Spanish-American Iron Company of which Mr. Rand is president. He was largely identified with the extensive developments of the mining districts on the north shore of Cuba, being very active in

JENNINGS S. COX, JR.

the explorations of the Mayari ore deposits. He was also one of the owners of the Ponupo Manganese Company. Mr. Cox's home was in Santiago, Cuba, but he came to New York last February in the hope of regaining his health. He was a member of the American Institute of Mining Engineers, the Alpha Delta Phi Fraternity, and the University Club of New York. He leaves a widow, the daughter of Frederick Ramsden, who was the British Consul at Santiago during the Spanish-American War.

FREDERICK WILLIAM NIEDRINGHAUS, one of the seven brothers of the name who founded the great enameling and stamping plants at St. Louis, now embraced in the National Enameling & Stamping Company, died August 29 at Granite City, Ill., aged 81 years. He was born in Westphalia, Germany, and located in St. Louis in 1854, living there until 1893, when he moved to Granite City to take charge of the Niedringhaus real estate interests which center in that town. He retired several years ago.

WILLIAM H. HOLLISTER, the founder and for 36 years manager of the Ramapo Wheel & Foundry Company, Ramapo, N. Y., died August 30 at the home of his daughter, in Passaic, N. J., aged 81 years.

The Philadelphia Steel & Forge Company, Tacony, Philadelphia, Pa., has installed in its rolling mill department a new power plant which will increase its output of finished bars 2000 tons per month. It has also added a heat-treating plant and is now specializing on high grade steels for automobiles, locomotives, machine tools, etc.

Copper Coating to Obtain Soft Areas in Case Hardening

Some information on the use of a coating of copper to protect parts of a steel production which is otherwise to be case hardened was given in a late issue of Engineering of London by a correspondent, who tells of his experience with copper after discarding the use of a plaster of fire clay, which was objectionable owing to the fact that it commonly cracks or peels off, and after another method of leaving more material on the parts required to be left soft than is actually needed in the finished article, the excess material being ground away.

He found that 0.001 in. of a coating of copper is sufficient to resist any vigorous attack of the case hardening material and that all that has to be done to protect the parts which must be soft is to deposit on them the film of copper. His observations on the subject are as follows:

A very good copper-depositing solution can be made in the following manner: To prepare 1 gal. of cyanide coppering solution, first carefully weigh out 3 oz. of copper sulphate, chemically known as $Cu\ So_4\ 5\ H_2O$, which contains 25.4 per cent. of the metal copper, and which should be dissolved in half a pint of hot water. Also weigh 4 oz. of sodium carbonate, or the ordinary washing soda, known as $Na_2\ SO_4\ 10\ H_2O$; this contains 37 per cent. of sodium and 63 per cent. of water, and should also be dissolved in sufficient hot water. It must be remembered that, as the hot water afterward passes out of the composition, it matters little how much is used when dissolving the above substances. After both have been thoroughly dissolved they should be mixed together in either vessel, when a green precipitate will form at the bottom; when quite settled down, the whole should be poured on to a rag or muslin screen, in order to drain the water from the precipitate.

The next item will be to scrape off the green precipitate, and place it in a suitable dish. It should then be redissolved with about 1¼ pints of ammonium hydrate, and will change to a very deep blue color. There is then required a quantity of potassium cyanide solution made up as follows:

Dissolve ½ lb. of lump cyanide of potassium in half a gallon of hot water, care being taken not to inhale the fumes from this solution, as they are very poisonous. Having made the solution of potassium cyanide, pour it into the vessel containing the precipitate and ammonium hydrate, until the whole color changes to that of old ale. At this point read off the quantity of cyanide solution used to de-colorize from blue to that of old ale, and whatever this quantity be, then add a further 25 per cent. to insure completion. The whole bulk can now be made up to 1 gal. by the addition of water (rain water if possible), when the solution will be complete and ready for use. The KCN, or cyanide solution, should be poured from a graduated measuring jar for the convenience of knowing the quantity used and to determine the 25 per cent. equivalent.

This plating solution is an alkaline one, and works better when hot, about 150 deg. F., being the most suitable temperature. After the plating-vat has been in use some hours, and should a green incrustation begin to form upon the copper anodes, it denotes insufficient KCN; therefore more potassium cyanide should be dissolved as before, and then added to the vat, until this green incrustation disappears. As an experiment, add about 1 pint, and then work the plating solution for a few hours and note results. The plating solution when complete may be worked with bunsen cells, or, better still, with current taken from a plating dynamo. A suitable voltage would be about 3 volts across the vat terminals.

The alkalinity of the plating solution can also be tested by the use of litmus papers, with which every electroplater should be familiar; therefore it now only remains to prepare the article to receive the coating of copper on the portion required to be left soft. This does not necessarily require a polished surface, but simply to be quite free from grease. As a matter of fact, the copper will deposit direct on any clean casting or forging, and after case-hardening the film of copper can be readily removed by the aid of a pocket-knife, so that the whole operation is quite a simple one, and good results are positively sure to be obtained.

Pittsburgh and Vicinity Business Notes

Samuel Diescher & Sons, consulting engineers, Pittsburgh, will make the plans for the new seamless tube plant to be built by the Standard Seamless Tube Company of Pittsburgh at Economy, Pa. Diescher & Sons have recently been granted patents on improved methods of making seamless steel tubing, which will largely be used in the plant.

The work of appraising the manufacturing properties of the Wheeling Steel & Iron Company, Whitaker-Glessner Company, Wheeling Corrugating Company, all at Wheeling, W. Va.; the LaBelle Iron Works, Steubenville, Ohio, and the Portsmouth Steel Company, Portsmouth, Ohio, which are in process of being merged into one company, is nearly completed by Julian Kennedy, engineer, Pittsburgh, and it is expected that the details of the proposed merger will be ready to present to the boards of directors of the interested companies within the next two weeks. The books are being audited by Price, Waterhouse & Co., and the ore properties are being appraised by Henry G. Dalton, Cleveland, Ohio. It is expected that within the next 30 days it will be known definitely whether the merger will become a reality.

R. M. Rush, Pittsburgh agent for the Kerr Tubing Company and the Falk Reduction Gear Company, has moved his office to room 2201, Oliver Building.

William G. Boyle, engineer for the Oliver Estate, Pittsburgh, has placed contracts for the equipment of the new Kaufmann-Baer Building, now being erected on property owned by the Oliver Estate in Pittsburgh, as follows: Babcock & Wilcox Company, two 665-hp. water-tube boilers, to be operated by Green Engineering Company chain grate stokers; Heyl & Patterson, Pittsburgh, coal storage and conveying equipment; Pittsburgh Valve, Foundry & Construction Company, high-pressure piping and connections; Iron City Heating Company, heating system.

The Green Engineering Company, Oliver Building, Pittsburgh, has received an order from the Allegheny Steel Company for the installation of ash-handling equipment for its power plant at Brackenridge, Pa.

The Pittsburgh office of the Babcock & Wilcox Company has received an order from the Otis Steel Company, Cleveland, Ohio, for a battery of six 600-hp. Rust water-tube boilers for the power plant in its new open-hearth steel works. The boilers will have Murphy automatic stokers, built by the Murphy Iron Works, Detroit, Mich.

The report that the Carbon Steel Company, Pittsburgh, has received a contract for 61 tons of class C armor plate for the new battleship No. 39 is officially denied. This company does not make any armor plate, and the only contract it has received from the Government was for 3900 tons of specially treated acid steel plates for the new American dreadnought.

The Standard Bridge Tool Company, Pittsburgh, has received an order from the Fort Pitt Bridge Works, Pittsburgh, for a Thomas spacing table equipped with multiple punch for its shops at Canonsburg, Pa. The table will be designed to punch two pairs of angles up to 8 x 8 in., two plates 40 in. wide, or one plate 8 ft. wide and 90 ft. long. A similar table was installed in the same plant by the Standard Bridge Tool Company about a year ago.

The National Transit Company, Oil City, Pa., has received a contract from the Lebanon Valley Consolidated Water Company, Jonestown, Pa., for a horizontal high duty pumping engine of 3,000,000 gal. capacity.

A new hotel project is under way at Johnstown, Pa., to be a 12-story fireproof structure and to be erected on Main street, opposite the Cambria Theatre. It is to contain 250 sleeping rooms to be located on the first 10 floors. The entire eleventh floor is to be used as a banquet hall, while the twelfth floor will be used as a meeting room for business men. Janson & Abbott, Pittsburgh, are the architects and have practically completed the plans. It is expected that active work will start shortly, and the steel for the new structure is almost certain to go to the Cambria Steel Company.

The Otis Elevator Company, Pittsburgh, has taken a contract for the installation of 24 electric elevators in the new department store being built by the Kaufmann-Baer Company in that city. There will be 16 passenger, four freight and four general service elevators. Equipment for the new power plant for the building will require additional electric motors and heating appliances.

Effective last week new freight rates became operative on coke to the Wheeling and Fairmont regions from Connellsville, Pa. The new rate from Connellsville to Wheeling is $1.20, being reduced from $1.30. The new Fairmont rate is $1.10, the former rate having been $1.20. These rates were reduced voluntarily by the railroads.

No. 2 blast furnace of the Pittsburgh Steel Company at Monessen, Pa., was blown in on Thursday, August 28, No. 1 having started August 5. The two stacks have a rated capacity of 800 to 900 tons of basic iron per day, all of which the company expects to use in its open-hearth steel plant at Monessen.

A year ago the Youngstown Sheet & Tube Company, Youngstown, Ohio, bought from J. V. Thompson, Uniontown, Pa., about 5000 acres of coking coal lands located in Greene County, Pa., at a reported price of $1000 an acre. The deed for the transfer of this property to the new owner was filed for record in Waynesburg, Pa., last week.

The John F. Robertson Company, Park Building, Pittsburgh, has been appointed representative in the Pittsburgh district for the Lytton Mfg. Company, New York City, maker of separating, return and vacuum traps and the Lytton reducing valve.

The John Eichleay, Jr., Company, Pittsburgh, has received a contract from the Cambria Mining Company, Toledo, Ohio, of which George M. Jones is president, for the erection of a steel coal tipple at its Bellaire, Ohio, works at a cost of about $22,000, and requiring 225 tons of structural steel. The company will install chain haul equipment for handling cars on the tipple and power plant equipment for electric operation. Estimates are being taken for the installation of boilers of 750-hp capacity, and the erection of a stack. The type of engines and generators has not been decided. George S. Baton & Co., First National Bank Building, Pittsburgh, are consulting engineers.

Prospects of Passing the Tariff Bill

WASHINGTON, D. C., September 2, 1913.—It now appears probable that the Underwood-Simmons tariff bill will pass the Senate by September 15 and be sent to conference. This appears to be the opinion of Republicans as well as the managers of the bill in the Senate, Chairman Simmons and the Democratic members of the Finance Committee. The bill is now in committee of the whole and will probably be reported to the Senate the latter part of the week.

When the bill shall have been formally reported to the Senate, Senator Cummins will move to substitute a new metal schedule prepared by him. This substitute provides rates lower than the present tariff, but higher than the pending bill. There seems to be no chance of the substitute being adopted.

The committee of the whole voted down the Sutherland amendment providing that goods in bonded warehouses at the date of the approval of the pending bill should be assessed with duty at the present rates. Figures compiled by the Treasury Department show that an unusual amount of merchandise has been imported in bond awaiting the going into effect of the new and lower rates.

At the request of Senator Thomas, of Kentucky, Democrat, and a member of the subcommittee which framed the metal schedule, paragraph 106 relating to beams, girders, joists, angles, etc., and paragraph 116 relating to round iron or steel wire, etc., were recommitted to the Finance Committee for further consideration. Senator Thomas did not indicate what changes are contemplated.

Chairman Simmons makes the statement that the bill will be a law by October 1. W. L. C.

The new blast furnace of the Youngstown Sheet & Tube Company, Youngstown, Ohio, known as furnace D, is about finished and is expected to be put in operation this week. It is of the same dimensions as the other three stacks and has a rated capacity of 500 tons a day.

The Allen Mfg. Company, Hartford, Conn., announces that its Canadian factory has been moved to St. Johns, Quebec.

Armor Plate Bids Rejected

Naval Secretary Daniels' Method of Securing "Real Competition"—Steel Castings Awards

WASHINGTON, September 2, 1913.—Secretary of the Navy Daniels is actively carrying out his campaign to force steel manufacturers to reduce prices on armor and steel plates for naval vessels, and on Saturday last put the finishing touches on a method adopted by him which he deems will give the government "real competition." The action taken was the awarding of a contract to the Carbon Steel Company for 3900 tons of special treatment steel, bids for which were opened earlier in the week. There was one other bidder, the Carnegie Steel Company, whose bid was higher.

The facts in this case are that several months ago the Navy Department advertised for this material and there were two bidders, the Carnegie Steel Company and the Carbon Steel Company. When the bids were opened they were as follows:

Carnegie Steel Company, 3417 tons of special treatment steel plates, $221.98 per ton; 483 tons medium, $221.98 per ton.

Carbon Steel Company, 3417 tons of special treatment steel plates, $226.24 per ton; 483 tons medium, $220.24 per ton.

The bids were rejected by Secretary Daniels on the ground that there was an understanding between the two bidders and that hence there had been no real competitive bidding. The contract was readvertised and the bids were opened last week. The Carnegie Company submitted its original bid. The Carbon Steel Company cut the price on both items to $187.04 per ton.

On Saturday Secretary Daniels formally awarded the contract to the Carbon Steel Company. No explanation is made as to how this was brought about, but if the Secretary continues to reject bids and then readvertise, in order to induce price cutting it is believed that he will in time find but little response from the steel companies.

In the past week, Secretary Daniels rejected all bids for armor for battleship No. 39, now building at the New York Navy Yard. He held that there was no competitive bidding. There were three bidders—the Bethlehem Steel Company, the Midvale Steel Company, and the Carnegie Steel Company. They bid on four classes of armor, $454, $518, $496, $548 respectively, and $1875 on bronze. The Carbon Steel Company was also a bidder for one of the items, 61 tons Class C. steel. The bid of the first three companies on this Class C was $548 per ton. The Carbon Steel Company's bid was $448 per ton. As this was only one unimportant item, the bid was rejected with the others. When Secretary Daniels rejected the bids he gave out the following statement:

"This morning the Secretary of the Navy had a long conference with Messrs. W. E. Balsinger, J. B. King, and E. O'C. Acker, representing respectively the Carnegie Steel Company, the Midvale Steel Company and the Bethlehem Steel Company, with reference to the bids which these three companies recently submitted on Class A, Class A-1 and Class B armor for battleship No. 39. These gentlemen maintain they have had no understanding or agreement whatever as to the prices they would each bid on armor plates, and that they did not know until bids were opened that every bid offered was identical.

"They contend that inasmuch as the Department some years ago divided the contracts for armor plate equally among these three concerns when their bids were not identical, the destruction of competitive bidding was due to the Department and not chargeable to them. The policy seems to have been that if the three companies bid different amounts the Department would send for representatives of the three companies and divide the contract equally among them on the basis of the lowest bid. Naturally, this destroyed real competition and the cost of armor plate gradually was increased until the time arrived when no really competitive bids were filed at all. These companies contend, therefore, that they should not be criticized because competition has been destroyed, and that the Department is to blame for the destruction of competition.

"The Secretary requested the representatives of each concern to send him a detailed statement showing the actual cost of manufacturing armor per ton, the cost of raw material and the separate costs of each process in its treatment and a statement in detail showing the amount invested in the respective plants. It has been decided to reject all bids made for armor plate for battleship No. 39. No action in awarding the contracts is likely until the statements of the three companies are received. When they have been received and digested, it is probable the Secretary will ask a hearing with the heads of each of these three companies and may visit the three plants. Before bids were opened yesterday a letter was received from the American-British Mfg. Company, who thought of bidding, stating that the time was too short for them to bid. The time may be extended in order to give this company and any others an opportunity to enter the competition."

The companies have not yet filed their statements with the Secretary, and therefore the whole matter is held in abeyance.

On Friday last Secretary Daniels awarded a contract for steel castings for battleship 39 to the American Steel Foundries, the price being $92 per ton. In announcing the award the Department issued the following statement:

"The Secretary of the Navy, Mr. Daniels, has today awarded the contract for the 343 tons of steel castings required for battleship No. 39, to be built at the New York Navy Yard, to the lowest bidder at their bid of $31,556, being $92 per ton. The Secretary's policy of insisting upon real competitive bidding for Government material contracts has resulted in a saving of approximately 30 per cent. on the prices paid in 1910 for practically identical material purchased for the battleship New York. The price then paid was $134 per ton as against $92, the price now paid. As a result of advertisement the four bids to furnish this material were as follows: American Steel Foundries, $31,556; Baldt Steel Company, $35,956.69; Bethlehem Steel Company, $38,416; Penn Steel Casting & Machine Co., $49,940."

Representative Britten, of Illinois, a Republican, has introduced a bill providing for the erection of a Government armor plant and he states that he will make efforts to have armor plate, etc., put on the free list.—W. L. C.

For the Stopping of the Steel Suit

A Washington dispatch says that a resolution calling upon the attorney-general to stop at once all proceedings against the United States Steel Corporation under the Sherman anti-trust law was introduced September 2 in the House by Representative Jefferson M. Levy of New York. It recites that the Steel Corporation is a beneficent influence in the nation. It refers to the fact that in the years of its existence the corporation has distributed in wages no less than $1,575,000,000 and that there have been not only extensive improvements in the quality of American steel but material reductions in the prices of the corporation's products. The resolution was referred to the committee on the judiciary.

Representative Levy's resolution is made more interesting by petitions recently presented to Congress calling for the discontinuance of the Steel Corporation dissolution suit. These have been signed by many thousands of the corporation's employees. One petition was signed by the great majority of the employees of the H. C. Frick Coke Company.

The Bureau of Standards, Department of Commerce, Washington, D. C., has recently issued two circulars, Nos. 14 and 26, which are of special interest to steel chemists. No. 14 is entitled "Analyzed Iron and Steels—Methods of Analysis," and contains detailed analytical methods for analyzing the various constituents of both iron and ordinary steels as well as special alloy steels. In circular No. 26, with the title "Analyzed Iron and Manganese Ores—Methods of Analysis," the complete methods for analyzing iron and manganese ores are given. In each case the methods are those used by the Bureau in analyzing its standard iron, steel and ore samples and are the result of examination of various chemical methods.

The National Steel Car Company, Ltd., Hamilton, Ontario, Canada, has opened offices in the Shaughnessy Building, Montreal, with George Condon as representative.

How Railroads Meet Emergencies

What the Pennsylvania Railroad Did When Its Lines Were Crippled by the March Flood

The Pennsylvania Lines, Pittsburgh, Pa., has issued a 72-page booklet, entitled "The 1913 Flood and How It Was Met by a Railroad." This is a most interesting story of the great flood of last March in Ohio and Indiana, which inundated cities and devastated vast areas in those States, so severely affecting all the local railroads, by the destruction of bridges and the washing away of tracks, that for a considerable time rail communications were completely suspended. The booklet, which has been prepared by Lewis S. Bigelow, tells in vivid language, with numerous illustrations, the manner in which the Pennsylvania Lines met the situation, and of the heroic efforts put forth by the officers and employees to re-establish the service. The story is told in several chapters, the first of which is entitled "The Coming of the Waters"; the second, "The Fight for Existence"; the third, "Caring for Passengers"; the fourth, "Rescuing the Railroad"; the fifth, "Relief Work," and the sixth, "The Floods Subside."

High tribute is paid to the energy and efficiency of the employees of the railroad in meeting the problems imposed and laboring loyally and without regard to working hours in putting matters in such shape as to re-open railroad service at the earliest practicable moment. The statement is made that no body of men working merely for money could have done what this army of employees did. The company showed at least some of its appreciation of the loyalty of the men when its mason and carpenter gangs and shop men engaged on damaged portions of the roads for more than 24 hours at a stretch were paid one and a quarter times for all hours worked, including the time consumed en route between headquarters and their work. Extras were also paid to individuals called on or volunteering for unusually hazardous work. Bonuses were paid to all classes of labor in varying amounts, reaching down to the track laborers who had been in continuous service of the road about a year and who were employed on wash-out work. The bonus to each of these latter was $10, the pay checks bearing the sentence, "As a token of appreciation of the spirit of co-operation shown during the recent flood." These bonuses and extra allowances amounted to more than $70,000.

The chapter on "Caring for Passengers" shows how humanitarian considerations had first place in meeting the sudden exigency. Train loads of passengers were marooned at many points, unable to proceed or return, and they had to be supplied with food. Cities were cut off from the surrounding country and their inhabitants suffered privations until relief was afforded. Extraordinary measures were devised by the railroad people to overcome these conditions without regard to recompense or reimbursement from any source.

The booklet has a historical value in giving the character and extent of this great visitation of nature. The direct property loss to the Pennsylvania Railroad is placed at $3,600,000. The conclusion is drawn that the possibility of such extraordinary losses, which always exists, provides the most pertinent of arguments for allowing the railroads to so fix their rates as to permit a surplus. The cost of repairment, under the ruling of the Interstate Commerce Commission, must be charged to operating expenses. It therefore seems vitally necessary that the railroads should be enabled to accumulate the necessary funds to meet such emergencies. The Pennsylvania Railroad system was fortunately in position to meet the heavy expense entailed and to push the work of repairing damages with the utmost vigor.

The Machinery Markets

Indications of an acceleration of business prevail in nearly all sections of the country, although in some cities dullness is still the feature. The ending of vacations and approach of fall weather are having a good effect everywhere. New York found the aggregate of miscellaneous business in August better than was expected, while some railroad inquiries give encouragement. In Philadelphia current sales are small, but improved activity is in sight. Dealers in Cleveland found business more active, partly as a result of the closing of some long pending deals. Conditions in Cincinnati are not yet normal, though it is believed that the teamsters' strike, which has harassed the city, is near its end and a busy fall is indicated. August business in Detroit did not run into large figures, but the total of single tool sales was fairly satisfactory and inquiries are now more plentiful. In Milwaukee the month just closed is pronounced the most satisfactory August in several years, and Wisconsin industrial affairs in general look good. Manufacturing plants in the Central South as a general rule have gone through the summer without reducing their working forces and present conditions are satisfactory. Confidence in the crops is making business better in the Birmingham district. Local sales have been light in St. Louis, but taking the territory as a whole improvement is shown. In Texas the inflow of money from sales of the cotton crop is already being felt in all lines. While the demand on the Pacific coast continues to be mostly for single tools, more life is evident and the outlook is encouraging. Features in that territory are the building of new steamships in various shipyards and the prospect of still better exportations of machinery to the Orient. The export business with the Far East has been an important factor this summer.

New York

NEW YORK, September 3, 1913.

The trade has before it a few new inquiries from railroads. The Boston & Maine has issued a list of about 19 machine tools required in its new repair shop at Mechanicville, N. Y. The New York Central is inquiring for 8 or 10 machines, mostly for boiler shop work and also for some woodworking machinery. The Chesapeake & Ohio is in the market for four or five tools, including a lathe, shaper, 35-in. drilling machine and a 1½-in. bolt cutter. Though the business indicated is not great, it has caused a more cheerful sentiment in the local market in view of the fact that the railroads have been doing very little buying for some weeks. Business generally is quiet, though the run of small, miscellaneous transactions, characteristic of the last few months, continues. On footing up the total of sales made in August the aggregate was found to be better than expected, although at best activity was, and is at present, only fair. An increased number of inquiries are being received. Some miscellaneous Government requirements, for which bids are to be opened September 16, include the following:

Two 3-ton electric hoists for Washington, D. C., schedule 5804.

One screw cutting geared head engine lathe for Philadelphia, schedule 5797.

Two squeezer type molding machines for Portsmouth, N. H., schedule 5800.

One pipe threading and cutting-off machine for Washington, D. C., schedule 5804.

To Be Opened September 30.

One high pressure steam-driven air compressor for Mare Island, Cal., schedule 5813.

Cutting and welding outfit for Mare Island, Cal., schedule 5814.

The Biggam Engineering Company, 668 Ellicott quare, Buffalo, N. Y., has been incorporated to manu- acture automobile and truck clutches, transmission and ontrol lever sets, and to do high-grade machine con- act work. The company has leased the Schaaf Build- g, 26-28 Lansing street. H. F. Biggam is president; . C. Fagley, vice-president; O. Seelbach, secretary and reasurer. The company is taking quotations for ma- ine equipment, consisting of lathes from 14 to 24 in., ill presses, milling machines, boring mills, etc.

The Berkley Supply & Mfg. Company, Inc., 420 West enty-seventh street, New York City, has been or- anized to manufacture a combination transit level and ement for pipe joints and other metallic connections, d several different processes of waterproofing mate- al. George Vitty is president. The company has the quired machinery.

The Sedgwick Machine Works, Poughkeepsie, N. Y., s been incorporated with a capital stock of $75,000 to anufacture machinery and conduct a general machine op business. D. R. Sedgwick, 50 Church street, New ork City, and J. I. and E. W. Wakelee, New York ty, are the incorporators.

The Elastic Spring Knit Corporation, Mohawk, N. , recently incorporated with a capitalization of $250,- 0 to manufacture hosiery and underwear, has pur- ased the Paragon Knitting Mill at Mohawk and will uip it for manufacturing operations at once.

The Babcock Mfg. Company, maker of agricultural plements, Leonardsville, N. Y., is rebuilding its fac- ry, recently destroyed by fire, and will re-equip it with w machinery.

The plant of Abendroth Bros., Port Chester, N. Y., being enlarged by the erection of a building to be ed for cleaning heater castings, pipe and fittings. uipment consisting of 20 tumblers, grinders, pneu- atic clippers and a dust arrester system, will be in- alled, also an overhead carrier system with electric sts, a three-ton crane and a 42-in. lifting magnet.

The Continental Can Company is taking bids for an dition to its factory at Syracuse, N. Y. The new ructure will be 102 x 165 ft., two stories.

Henry & Allen, Auburn, N. Y., manufacturers of drop rgings, are erecting a new building, 60 x 150 ft., at er plant, which is to be ready for occupancy in about months. Equipment consisting of drop hammers, esses and special tools will be installed.

The Swift Machinery Company, Hornell, N. Y., has en incorporated with a capital stock of $30,000 to anufacture special machinery, etc. Arrangements are ng perfected for a manufacturing plant. J. C. Prime, Bodenstab and E. Smith of Hornell are the incorpo- tors.

The Superior Mfg. Company, Hoosick Falls, N. Y., establishing a branch plant at Cambridge, N. Y.

The Semet-Solvay Company, Syracuse, N. Y., has contracts for the construction of a large addition to made to its foundry plant, 90 x 146 ft., and a wing, 0 x 160 ft., of structural steel and brick. The cost ll be $50,000, exclusive of equipment.

The Motor & Mfg. Company, Dunkirk, N. Y., has arded the contract for erection of its new factory ildings, 57 x 85 ft., two story and basement, and 30 x ft., one story.

The Eckman Furniture Company, Jamestown, N. Y., s broken ground for a large five-story addition to its ctory at Jones and Gifford avenues.

The Jamestown Upholstering Company, Jamestown, Y., has a new factory building under construction on st Third street, which will soon be ready for equip- ent.

A large addition is being made to the plant of the mestown Shale Paving Brick Company, Jamestown, Y.

The Alliance Furniture Company, Jamestown, N. Y., completing a new factory building at its plant on llen street.

H. P. Robertson & Co., Jamestown, N. Y., are build- g an addition of brick construction to their plant on eele street.

A two-story factory addition is being made to the alleable iron and steel castings plant of the Pratt & tchworth Company, Buffalo.

The Upson Company, manufacturer of wallboard, ckport, N. Y., has plans in preparation for three fac- ry buildings of concrete and brick construction to ntain over 100,000 sq. ft. of floor space, which will be ded to its plant.

The Rochester Motors Company, Inc., Rochester, Y., has been incorporated with a capitalization of 00,000 and will engage in the manufacture of motors, c. E. F. Davidson, E. H. Gruelle and E. H. Stearns e the incorporators.

The Brocton Naboth Grape Juice Company, Brocton, N. Y., has awarded the contract for the construction of a five-story and basement factory, 87 x 87 ft.

The United Box Board Company, Lockport, N. Y., has plans under way for a manufacturing plant consisting of three buildings, 60 x 400 ft., 60 x 160 ft. and 60 x 80 ft., which it will erect. Joseph Eilers is general manager of the company.

The Medina Iron & Brass Company, Medina, N. Y., has let the contract for a foundry building, 90 x 115 ft., one story.

A rocking room, washhouse, and cold storage building, 65 x 121 ft., two stories, is being erected by the Tonawanda Brewing Company, Tonawanda, N. Y.

The Biggam Engineering Company, Buffalo, has been incorporated with a capital stock of $200,000 to manufacture transmissions, clutches and other automobile parts and to operate a general machine shop. C. E. Buck, 247 Rhode Island street, Buffalo; H. F. Biggam, 873 Dewey avenue, Rochester, and N. D. McDowell, also of the latter city, are the incorporators.

The Kelker Blower Company, Buffalo, has been incorporated with a capital stock of $40,000 to take over and continue the business of George Kelker, which was established some time ago for the manufacture of sheet iron blowers, fans and discs and the conducting of a general sheet iron and coppersmith business. Plans are now in preparation for a considerable addition to the plant of the company at Harrison street and the Pennsylvania Railroad.

The plant of the American Sterilizer Company at Twelfth and Plum streets, Erie, Pa., is to be extended by the addition of two reinforced concrete buildings, 35 x 125 ft., three stories, and 40 x 160 ft., two stories, and a 45 x 45 ft. extension of the present building.

The H. F. Watson Company, Erie, Pa., is erecting a pulp crushing mill, 75 x 152 ft., on the harbor front. Requisite machinery equipment will soon be ordered.

The Gerhard Lang Brewing Company, Buffalo, has completed plans for the erection and equipment of a refrigerator building, 75 x 95 ft., five stories, at its plant at Best and Jefferson streets. E. G. S. Miller is president.

The Montgomery Electric Light & Power Company, Canajoharie, N. Y., is in the market for two 50-kw., 15,000-220 volt transformers. Address W. J. Roser, manager.

The Graphite Metalizing Company, Yonkers, N. Y., has plans completed for a factory building, 35 x 135 ft., two stories, which it will erect at once.

The Waterloo Water Company, Waterloo, N. Y., will install a new waterworks system. Plans call for a cement block pumping station, 30 x 70 ft., two stories, to contain two single-acting triplex pumps of 500,000 gal. per day capacity, to be direct connected to individual 30-hp. motors, and one centrifugal underwriter's fire pump, directly connected with an 85-hp. motor, having a capacity of 2000 gal. per min. Two filter units are provided for, each with a capacity of 500,000 gal. per day.

M. L. Grove, Tylersburg, Pa., has organized a company, capitalized at $50,000, which will build a plant at Garland, Pa., 50 x 200 ft., one story, for manufacturing a patented automatic gas stop and gas pressure regulator and other small brass gas fittings. Mr. Grove wishes prices on lathes. Other machinery will also be required, but has not yet been decided upon.

New England

BOSTON, MASS., September 2, 1913.

August was a dull month with the dealers, and the manufacturers whom they represent are indicating, by appeals to them for new business, that the factories have a shortage of incoming orders. In Providence trade is a little better, partly because the business of the manufacturing jewellers is picking up and partly because the general demand is improving. Along the rivers manufacturing plants are crippled to some extent by the low water which has resulted from a somewhat serious lack of rain.

The trade has heard with much regret the announcements that the plant of the Columbia Motor Car Company, Hartford, Conn., has been permanently closed by its owner, the Maxwell Motor Company, which will give up the manufacture of Columbia cars and concentrate its manufacturing in the Middle West, and that the American Locomotive Company will discontinue entirely the manufacture of Alco automobiles and trucks, which has been carried on in Providence, R. I.

More cheering is the plan of the Pope Mfg. Company, Hartford, to increase its working capital by the issue of $2,000,000 of new securities, and the purchase by the Locomobile Company of America of a tract of land adjacent to its works at Bridgeport, Conn., the purpose being, it is stated, to make enlargements in the near future.

The Corbin Screw Division of the American Hardware Corporation, New Britain, Conn., will erect a building, 45 x 120 ft., seven stories, which will be filled with automatic screw machines. No additional equipment will be purchased.

The Skinner Chuck Company, New Britain, Conn., has just shipped three chucks, the combined weight of which was 3200 lb. Two of them weighed 1250 lb. each, and the third 700 lb. The company is completing plans for an additional building and is making extensive improvements on the present works.

The works of Hackett & Witham, Skowhegan, Me., were not so seriously damaged by the recent fire as first reported. The storehouse, office and power house were burned. No new equipment will be required. The company manufactures circular sawmills and shingle and lath machinery and operates an iron foundry.

Higgins & Co., Holyoke, Mass., will build an addition to their foundry, 20 x 42 ft., of brick, with steel and reinforced concrete roof.

The business of the E. C. Bliss Mfg. Company, Providence, R. I., will be moved to North Attleboro, Mass., and merged with that of A. H. Bliss & Co., this action being the result of the reorganization of ownership of the two houses, both of which manufacture jewelry.

The Universal Safety Tread Company, Boston, will erect a factory on Crescent Park, Waltham, Mass., 65 x 125 ft., one story. The company will be in the market for a few machine tools. Other requirements are not yet determined. The business is not a new one, but the company has recently been incorporated under a Massachusetts charter, with an authorized capital stock of $115,000, the organizers being Walter T. Hannigan, Eugene G. Smith and Chester G. Clark.

The American Silver Company will build an additional factory at Bristol, Conn., 45 x 80 ft., one story.

The Winchester Repeating Arms Company, New Haven, Conn., will build an addition to its drop forging department, 52 x 100 ft., of brick.

Henry Lee, receiver for the E. H. H. Smith Silver Company, Bridgeport, Conn., has been given permission by the superior court of Connecticut to continue the business for a period of four months.

The Pratt & Cady Company, Hartford, Conn., manufacturer of steam and water fittings and hydrants, has been sold by the receiver under an option to Bishop White, West Hartford, who assumes all liabilities. The business is now prospering.

The Abbott Ball Company, Hartford, Conn., manufacturer of steel tumbling balls and tumbling barrels, will build a factory, 50 x 125 ft., one story, of brick, with steel columns and roof beams.

B. F. Perkins & Sons, Holyoke, Mass., will build an additional factory, 75 x 116 ft., two stories.

The Starr Package Machine Company, Northampton, Mass., and 315 West Ninety-seventh street, New York City, has been incorporated under a Massachusetts charter with an authorized capital stock of $50,000 and will manufacture machines to produce packages of paper or composite material, paper milk bottles being a specialty. The company expects to have its machinery built under contract for the present and intends to establish shops later when location and producing capacity are decided upon. George R. Spear, the secretary of the corporation, and Arthur L. Kingsbury, its treasurer, are residents of Northampton, where they are interested in other manufacturing enterprises.

The Ansonia Electrical Company is to build an additional factory.

Additions to general manufacturing facilities in New England include the following: Guerin Spinning Company, Woonsocket, R. I., addition, 75 x 150 ft., one and two stories; Charles W. House & Son, Unionville, Conn., factory, 60 x 12 ft., three stories, with one-story ell, 26 x 62 ft.; Cole-Roscoe Mfg. Company, South Norwalk., Conn., factory, 30 x 70 ft., two stories; Keyes Products Company, Norwich, Conn., one-story factory, 61 x 190 ft., to replace burned plant; Rubber Regenerating Company, Naugatuck, Conn., factory, 60 x 130 ft., three stories; Swiss Textile Company, Warren, Mass., mill, 75 x 100 ft., two stories, of cement blocks; Imperial Dyeing Company, Hartford, Conn., one-story addition, 50 x 80 ft.

An order has been signed appropriating $50,000 f a new power unit at the city lighting plant, Taunto Mass.

Chelmsford, Mass., has voted $60,000 bonds f waterworks.

Philadelphia

PHILADELPHIA, PA., September 1, 1913.

The volume of actual business declined last we and most of the few sales made were of small sing tools. There is, however, a fair volume of business sight. While the bulk of the inquiry has been along th line of single tools several groups of equipment are u der consideration. Transactions are expected to show material improvement in the current month. Railroa business continues at a low rate. The second-hand ma chinery field reflects the general conditions of the ma ket, being dull. Considerable power equipment bus ness is pending and this branch of the trade looks trifle better. New business in iron and steel castin moves slowly, steel casting plants in particular bein rather dull. Very little machinery business for expo has been in prospect.

The Killian Bros. Company is taking subbids f the erection of a two-story factory building, 50x80 f from plans by H. Zimmerman, to be erected at Edg mont and Orthodox streets, Frankford, Philadelphi The new building will be used for an extension of t ribbon manufacturing business.

Bids will shortly be asked by the city of Philade phia for the erection and equipment of a machine sho to be built at Eleventh and Reed streets, from plan and specifications by Ballinger & Perrot, engineers.

Day & Zimmerman, engineers, Philadelphia, hav plans in preparation for a power house and plant to b erected in Oil City, Pa., for the Citizens Traction Com pany, of that city. Details as to the proposed improve ment are not ready.

Crook, Kries & Co., Baltimore, Md., who recentl acquired the Light street plant of the T. C. Basho Company of that city, have built at Sharp and We streets a two-story building, 85x100 ft., for the manu facture of boilers, tanks, stacks and sheet iron work The factory has been fully equipped with machinery practically all electrically driven.

E. R. Godschalk has had plans prepared by Clyde S Adams for a four-story concrete manufacturing buildin 35 x 60 ft. to be erected at 1530-1532 Wood street, Phila delphia.

The Eastern Coal Dock Company, Greenwich Piers Philadelphia, is erecting a large thawing plant to b used in connection with coal handling. The plant wil be located in a building 49 ft. 6 in. x 266 ft., of steel an concrete construction, on Delaware avenue below Poi lock street.

Bids are being taken against revised plans for a 60 x 358-ft. addition to the plant of the Universal Paper Bag Company, New Hope, Pa. Plans are by F. R. Parker Trenton, N. J.

The A. & H. Foundry Company, manufacturer o high-grade castings, Hamburg, Pa., will erect a large warehouse and additional shops in the near future. The company is in the market for a small second-hand lathe and planer.

The Woven Steel Hose & Rubber Company, Tren ton, N. J., has let contracts for the erection of a brick and concrete building on Prospect street, to take the place of temporary buildings erected immediately fol lowing the destruction of the original plant by fire The new building is to be considerably larger than the one burnt. The company has just completed a corru gated iron and concrete building and bought ground to provide for future expansion. It manufactures armored air, steam and water hose, packing, linings and fric tion rings.

Specifications for two additional boilers for the pumping station, Trenton, N. J., have been drawn They will be examined by disinterested boiler experts before bids will be received.

It is reported that the E. I. du Pont de Nemours Powder Company, Wilmington, Del., is planning to consolidate at that city its machine shops at its several plants located at Carneys Point, Haskell and Repaun N. J. The capacity and facilities for the manufacture of its powder mill machinery would be materially increased by such a consolidation.

The Jones Holloware Company, Baltimore, Md., has taken out permits for the erection of a one-story addi tion 30 x 169 ft. to its foundry plant at Montford ave nue and Chase street.

The Mogul Starter Company, 112 West Adams street, Chicago, has been incorporated to deal in machinery by J. T. Buchanan, R. C. Nicholson, and C. W. Paltzer.

W. M. Brovine, mayor, Taylorville, Ill., will receive bids until September 8 for a 750,000-gal. pumping engine, power plant, etc.

The Testall Mfg. Company, Aurora, Ill., has been incorporated with a capital of $25,000 by R. W. Childs, C. J. Ryan and P. H. Graham to manufacture metal articles.

The Padrett Tractor Company, Streator, Ill., has been incorporated with a capitalization of $50,000 for the manufacture of machinery. Incorporators are Paul J. Heflin, George W. Little, Arthur B. Shap, all of Streator.

The Hume Mfg. Company, Hume, Ill., recently organized with a capital stock of $50,000 by J. W. Maugher and R. O. Rikman for the manufacture and sale of a traction engine, has completed a new factory building. Most of the machinery is installed.

Frank Gosset of Hiawatha, Kan., and William Gosset of Falls City, Neb., have established a factory at Humboldt, Neb., for the manufacture of the recently patented Gosset hinge and wheelbarrow.

Factory B of the Red Wing Sewer Pipe Company, Red Wing, Minn., was destroyed by fire with a loss of $33,000. The company expects to have a new building erected within 60 days.

The Missoula Light & Water Company, Missoula, Mont., will spend between $60,000 and $75,000 in extending its steam heating system.

The First National Bank, Minneapolis, Minn., and the Minneapolis, St. Paul & Sault Ste. Marie Railway Company are having plans drawn for a joint 20-story building, to be erected at Fifth street and Marquette avenue, Minneapolis, to cost about $1,200,000.

Milwaukee

MILWAUKEE, WIS., September 1, 1913.

Considering the fact that August is always a quiet month, local machinery and tool builders declare the period just closed was the most satisfactory eighth month they have experienced in several years. There was just enough new business booked to attain this result. Shops are working at normal in all but a very few instances, and these will fill up their payrolls at once. The milling machinery people have been working at top speed all through the summer, and while new business was spotty it gave them a much needed opportunity to catch up. Throughout Wisconsin the feeling is improving and industrial conditions are gratifying. The city of Beloit, especially, is getting its full share of industrial extension, while Racine, Kenosha and other cities are not far behind in the matter of new enterprises and extension of present shops.

The Van Dyke Knitting Company, Milwaukee, Wis, will erect a manufacturing building at South Pierce street and Fifteenth avenue to cost $55,000.

Plans are being prepared by the Davis Mfg. Company for the erection of a new $100,000 factory and office buildings at West Allis, Wis. The new building will be 250 x 200 ft. and will include a power plant. The company manufactures motors.

The F. Mayer Boot & Shoe Company, Milwaukee, has broken ground for its new factory building 150 ft. square, three stories, to adjoin the present plant at Lapham and Clinton streets.

The city of Superior, Wis., is considering plans for a reinforced concrete municipal machine and repair shop, consisting of blacksmith, machine, carpentry and painting departments.

The Common Council of Menasha, Wis., has closed a contract with the Busch-Selzer Diesel Engine Company, St. Louis, for a large Diesel oil engine to be installed in the municipal water and light plant.

The new buildings to be erected by the Allis-Chalmers Mfg. Company, West Allis, Milwaukee County, to accommodate the departments which will be moved from Chicago, will be started this week. The larger building will be 100 x 375 ft., of steel and brick, and will be used for boiler and flange production. The other building will be 50 x 375 ft. and equipped for perforating work.

The Phoenix Mfg. Company, Eau Claire, Wis., is building four large locomotives for the McIntire Iron Company, North Creek, N. Y., for ore hauling. The contract includes several carloads of sled-cars. The outfit works without tracks.

The Aluminum Castings Company is operating its Wisconsin foundry at Manitowoc after a lapse of several months and the force of molders is being increased weekly. It was at first intended to dismantle the plant and move the equipment elsewhere, because of continued labor troubles. The Manitowoc plant is now needed to produce part of the castings on the many automobile contracts which the Cleveland company has secured. Most of the work now going on at Manitowoc is for the Mitchell-Lewis Motor Company, Racine, Wis.

The R. S. Perfection Plating Company, Janesville, Wis., has established a new and larger shop at 117 Dodge street. T. W. Richards and J. Snyder own the works.

The Globe Pump Company of Green Bay, Wis., organized recently to manufacture a new type of mine and well pump invented and patented by James Gleason, is using space in the Hess Iron Works until it can build a shop of its own. The company will then also engage in the manufacture of well accessories and supplies and drilling machinery.

The city of New London, Wis., is asking bids for a pump and dynamo. W. G. Kirchhoffer, Madison, Wis., is engineer.

The Wolf River Improvement Company, Appleton, Wis., has perfected its organization and will begin at once on its 6,000,000,000 gal. reservoir in Langlade County, which will insure Fox River Valley water power owners of flowage during the six months of the year when the water stage is low. The officers and directors, as well as principal stockholders, are large manufacturers of the Fox River Valley and include John I. Beggs, St. Louis, president of the Wisconsin Traction, Light, Heat & Power Company. Frank J. Sensenbrenner of Neenah is president and Judson G. Rosebush of Appleton is secretary.

The real estate and other properties of the bankrupt Yale Mfg. Company at Oostburg, Sheboygan County, Wis., have been purchased by F. A. Tuschen of Milwaukee and A. G. Sheuerell of Sun Prairie, Wis., for $17,266.56. The new owners will begin operations at once, continuing the manufacture of automobile parts and accessories which the Yale Company carried on.

Detroit

DETROIT, MICH., September 2, 1913.

While the total amount of business transacted during August does not run into large figures, the month was a satisfactory one to most dealers. Conditions continued to improve and with the end of the vacation season in sight an added impetus to business is confidently expected. A fair number of sales were reported the past week, mostly to the general manufacturing trade. Inquiries are plentiful and indicate a heavier buying movement.

H. D. W. Mackaye, Detroit, is at the head of a new company which is being formed to manufacture automobiles in this city. A site has been obtained and ground will be broken this month for the erection of the first building. Details as to the size of the plant and equipment required are not yet available.

The Progressive Forge Company, Detroit, has been incorporated with a capital stock of $100,000 to manufacture drop forge products. The new company has acquired a three-acre tract at the Conant road and the Grand Trunk Railroad and plans for the erection of three buildings are now being drawn. Alfred Johnson is president, M. C. Hechtner vice-president, and Leo A. Rosier secretary-treasurer, all of whom are prominently identified with the automobile industry.

The Ditzler Color Company, Detroit, has awarded the contract for a two-story brick addition to its factory.

The Detroit Ball Bearing Company, Detroit, has been incorporated with $2000 capital stock to operate an automobile repair shop. Joseph Pauer and James Corney are the principal stockholders.

William Liebig & Company, Detroit, has been incorporated with $60,000 capital stock to manufacture and deal in machinery. The incorporators are William and Walter J. Liebig and William E. Leuck.

The American Cycle Car Company, Detroit, has increased its capital stock from $1000 to $200,000, preparatory to beginning manufacturing operations.

Charles W. Kalder has organized the Kalder Mfg. Company, Detroit, Mich., with a capital stock of $100,000, to manufacture sheet metal specialties. A factory will be established at Detroit about January 1, 1914. Mr. Kalder is in the market for a complete outfit of sheet metal machinery, such as plain, toggle and drawing presses, double seamers, squeezers, beading and flanging machines, 120 sets of dies, an electric spot welder, baking ovens, motors, etc.

Chicago

CHICAGO, ILL., September 1, 1913.

J. Sievers has secured a permit for the construction of an addition to the Robert Krause factory at Fourth and Warren streets, Chicago, to cost $15,000.

Jenney, Mundie & Jensen, 30 South La Salle street, are the architects for a two-story brick factory to cost $150,000 to be erected at 39-40 Throop street, Chicago.

Shepard Electric Crane & Hoist Company, a New York corporation, has been organized with offices in the Peoples Gas Building, Chicago, for the manufacture and sale of machinery.

Storage Battery Company of America, Chicago, has been incorporated with a capital of $30,000 for the manufacture and sale of electric appliances. The incorporators are Francis A. Woods, Thomas H. Mars, and Victor Bluchowsky.

The Springsted Mfg. Company, Chicago, organized by Wheaton R. Springsted, William Pardeck and Otis Stimes, will manufacture and sell metal, iron and wood devices.

The Lyons Machine & Mfg. Company, Muskegon, Mich., has outgrown its present facilities and is installing additional machinery.

The Brunswick-Balke-Collender Company, Muskegon, Mich., will install a new power plant of 1200-hp. capacity. Four new dry kilns will also be erected.

The Rapid Heater Company, Grand Rapids, Mich., has been incorporated with $15,000 capital stock. A. B. Knowlson and C. L. Grinnell are the principal stockholders.

Stow & Davis, Grand Rapids, Mich., will build a new power plant, 20 x 40 ft., one-story brick, for their factory on South Front street, which will require the installation of a new 150-hp. engine.

The city water department, Pontiac, Mich., is said to be considering the installation of an 8,000,000-gal. pump, to cost $31,000.

Cleveland

CLEVELAND, OHIO, September 2, 1913.

Business with dealers showed more life the past week than at any time in the earlier part of the month as the result of the placing of some business that had been pending for several weeks. The largest order was placed by the American Steel & Wire Company, whose inquiry for considerable machinery for its Cuyahoga works in Cleveland was recently noted. This business was distributed among local dealers. Taken as a whole, August business was somewhat lighter than that of July. However, it was close to normal for a midsummer month. Quite a few orders are coming out for single tools, but very little inquiry is pending. Second-hand machinery is moving fairly well. Considerable used machinery has recently been thrown on the local market as a result of changes in shop equipment.

The New York Central Railroad has an inquiry out for the following woodworking tools for its Westleyville and Ashtabula shops:

One 36-in. cut-off saw.
One hollow chisel mortiser.
One gaining machine.
One self-feed ripsaw.
One large bandsaw.
One automatic handsaw filing and setting machine.
One five-spindle wood boring machine.
Two 3-in. pipe machines.

The Clay Engine Company, Cleveland, has been incorporated with a capitalization of $30,000 to manufacture internal combustion engines. The incorporators are E. M. Clay, H. F. Schmidt, C. F. Schmidt, F. R. Ward and J. I. Clay.

The Acme Foundry Company, Cleveland, has just completed an addition to its plant, 30 x 100 ft., to be used as core room and pattern vault. The section to be used for the latter department is two stories. An additional 72 in. cupola will be installed shortly.

Proposals will be received September 17 by W. J. Springborn, director of public service, Cleveland, for compressed air or storage battery locomotives and a charging plant for the city water department.

The Newark Tool Company, Newark, Ohio, recently organized with a capitalization of $10,000, will establish a plant for the manufacture of staybolt taps, reamers and other tools used in boiler making.

A new sheet metal working plant will be established shortly at Warren, Ohio, for the manufacture of steel forms used in concrete construction work. Negotiations have been completed between the Warren Board of Trade and W. C. Pendleton, representing an Illinois company, which will occupy the plant formerly used by the Vulcan Furnace Company. New machinery will be installed and it is the intention to have the plant ready for operation by January 1.

The U. S. Mfg. Company, Warren, Ohio, has been organized to manufacture hand vacuum sweepers. The company is establishing a plant in the building of the Winfield Mfg. Company. E. D. Knapp is president and sales manager; H. W. Taylor, vice-president and secretary, and V. C. Taylor, secretary and manager.

The director of public service, Fostoria, Ohio, will receive bids until September 22 for an extension to the sewerage disposal plant. A water pressure system will be installed together with the necessary motors and pumps.

The Electric Furnace Company, Alliance, Ohio, has increased its capitalization from $100,000 to $200,000.

Orrville, Ohio, has voted to issue $41,000 bonds to build a municipal lighting plant.

R. M. Pillmore, director, Akron, Ohio, will receive bids until September 16 for two hydraulic turbines and generators, 250 and 75 k.v.a.

Wheeling

WHEELING, W. VA., September 2, 1913.

The Mount Hope Power Company, Mt. Hope, W. Va., has been incorporated with $25,000 capital stock by John Faulkner, Ben Rurvitz, T. L. Feazel, of Mt. Hope; John B. Hoffmeier, Parkersburg, W. Va., and James Faulkner, MacDonald, W. Va.

The Eclipse Roller Mill Company, Graham, Va., has decided to erect a large new plant. The machinery in the present building at Hockman will be transferred to the new structure and new machinery addded.

Efforts are being made in Charleston, W. Va., to raise $27,000 to furnish free factory sites for the Fletcher Bros. Stamping & Enameling Works, Anderson, Ind., and the Olney Flint Glass Works, Olney, Ill., which desire to move their plants to Charleston.

The Parkersburg Corrugating Paper Company, Parkersburg, W. Va., has leased the Parkersburg Upholstering Company building and is fitting up a plant. The company will manufacture corrugated paper for the shipment of bottled articles, tobacco, parcel post packages, etc.

The plant of the Charleston Milling & Produce Company, Charleston, W. Va., which was destroyed with a loss of $114,000, will be rebulit.

The Logan Ice & Cold Storage Company, Logan, W. Va., which was recently organized with $50,000 capital stock, is prepared to proceed with the erection of its factory.

The National Reflector Company, Clarksburg, W. Va., will be in the market for equipment for an addition to its plant. It will need a fan, blower, transmission equipment, etc.

The American Spar Company, Wheeling, W. Va., is reported to be in the market for two steam-driven air compressors. H. B. Haase is manager.

Cincinnati

CINCINNATI, OHIO, September 1, 1913.

The improvement noted last week with a number of machine tool builders is not yet general, and conditions are far from normal. However, indications point to a fairly busy fall season, contingent mostly upon a revival of the export trade. Automobile manufacturers are not buying tools very freely, and orders received are only for single tools for replacement purposes. From an authoritative source is a report that the striking teamsters will all return to work this week. The majority of the local manufacturers and merchants stood firm in an agreement not to recognize the teamsters' union formed several weeks ago by outside labor agitators, and as a consequence the strike was a failure. Boiler and tank makers report a little better business, and there is some improvement with manufacturers of small electrical equipment.

The Modern Machine Tool Company, Winton place, Cincinnati, has voted to increase its preferred stock from $70,000 to $115,000, and at an early date will add considerable new equipment.

The city of Ironton, Ohio, has decided to erect a new pumping station and filtration plant to take the place of the present waterworks system. Hering & Gregory, New York, are the engineers who drew up the plans for the proposed plant.

The proposed additions to the plant of the Dayton Engineering Laboratories, Dayton, Ohio, will be much larger than recently noted. The main building will be

x 400 ft., six stories, of reinforced concrete construction. Other smaller buildings will be erected, all of which will be used for manufacturing and storage purposes. The company manufactures the Delco self-starters for automobiles and auto trucks.

The pipe shop and cement storage warehouse of the Olston Steel Car Company, Columbus, Ohio, were destroyed by fire August 27. Both structures will be rebuilt at once.

The name of the Producers Supply & Tool Company, Marietta, Ohio, has been changed to the Producers Tool & Supply Company.

The Oxford Pottery Company, Cambridge, Ohio, will soon be incorporated with $100,000 capital stock to erect a large pottery plant for which special equipment will be needed. Particulars may be obtained from A. R. Murray, Cambridge.

It is rumored that the Springfield Railway Company, Springfield, Ohio, will make some extensive shop additions as well as building new lines. Details are not yet available. The company recently increased its caiptal stock from $1,000,000 to $2,500,000.

The electric lighting plant of Henderson, Ky., will be rebuilt at an early date and considerable new power equipment installed.

The International Steel & Iron Company, Evansville, Ind., will rebuild its plant recently destroyed by fire with a loss of over $50,000.

The Central Machine & Foundry Company, Marion, Ind., is building an addition for which additional equipment will be required.

The Kokomo Steel & Iron Company, Kokomo, Ind., is reported to be considering plans for further extensions to its plant in addition to those previously mentioned.

Indianapolis

INDIANAPOLIS, IND., September 1, 1913.

The Kugel Auto Company, Indianapolis, will take over the manufacture of the Auglaize auto truck of New Bremen, Ohio, and will erect a two-story concrete building, 80 x 175 ft., for a plant. Irwin G. Kugel is president of the company; Robert E. Kugel secretary, and S. Gunderson superintendent.

The Ark Mfg. Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture dressing machines. The directors are A. R. Kennedy, C. E. Gregg and P. W. Kennedy.

The Machinery Exchange, Indianapolis, has been incorporated to manufacture, repair and deal in machinery. The directors are William, H. C. and Albert Kesy.

The Irvington Ice Company, Indianapolis, recently incorporated with $50,000 capital stock, will build an ice plant. The directors are T. C. Howe, F. B. Davenport and G. K. Jeffries.

The capital stock of the Queen Grader & Cleaner Company, Indianapolis, has been increased from $10,000 to $150,000.

The Stenotype Company, Indianapolis, Ind., has let the contract for the construction of its new plant at Mars Hill. The main building is to be 52 x 500 ft., three stories, reinforced concrete. The cost of the plant with its motor-driven machinery will represent an investment of $500,000.

The Independent Envelope Company, Indianapolis, Ind., is erecting a factory building and power house at East Washington street and Sherman drive, to cost about $75,000. It is expected that the building will be fully equipped and in shape for occupancy by October 15.

The Dice Engine Company, Anderson, Ind., recently organized, has taken over the business of the Anderson Motor Company of that city, and will continue the manufacture of engines, transmissions, differential jack shafts and other parts. Next spring the company contemplates occupying other quarters. At present the company is not in need of new equipment. T. C. Werbe is president and treasurer; S. M. Hickman, vice-president, and E. F. Dice, secretary and manager.

The Indiana Box Factory, Elwood, Ind., suffered a loss from fire approximating $100,000.

The Independent Ice Company, South Bend, Ind., has been incorporated with $20,000 capital stock, to manufacture ice. The directors are G. D. Staples, D. P. Clem and J. W. Hamilton.

The Wild Cat Utilities Company, Cutler, Ind., has been incorporated with $25,000 capital stock, to supply electric light, heat and power. The directors are John Johnson, Robert F. Johnson, Jesse Johnson, J. M. Johnson and B. B. Johnson.

The C. W. Osgood Company, Elkhart, Ind., has been incorporated with $10,000 capital stock to manufacture band instruments. The directors are Charles W. Osgood, P. J. Osgood and Guy H. Butt.

The Roach Lamp Mfg. Company, Linton, Ind., has been incorporated with $25,000 capital stock to manufacture miners' carbide lamps. The directors are Alonzo Roach, L. M. Brothers and Arthur A. Nolan.

The Princeton Water Company, Princeton, Ind., will establish a sub-pumping station to increase the pressure.

The Flindall-Morris Company, Griffith, Ind., has been incorporated with $50,000 capital stock, to conduct a foundry and manufacture furniture. The directors are J. C. Flindall, Edward T. Morris and Robert G. Flindall.

The Firetuff Mfg. Company, Huntington, Ind., has been incorporated with $150,000 capital stock to manufacture fireproofing material. The directors are Ralph Runyan, P. V. Plastires, Paul M. Taylor, J. W. Caswell and Charles M. Lucas.

The Anderson Die & Model Company, Anderson, Ind., has been incorporated with $10,000 capital stock to manufacture machinery. The directors are Isaiah Miley, L. E. Poole and H. L. Hedrick.

The Automatic Machinery Mfg. Company, Terre Haute, Ind., has increased its capital stock $20,000.

The Building Materials Company, Evansville, Ind., has been incorporated with $20,000 capital stock to deal in building material. The directors are Louis C. Shepherd, Albert L. Cook and Paul H. Schmidt.

The plant of the Wood-Mosaic Flooring Company, New Albany, Ind., destroyed by fire a few weeks ago, with $250,000 loss, will be rebuilt. A temporary sawmill has been put in operation.

The Hammond Machine & Forge Works, Hammond, Ind., has decreased its common stock from $25,000 to $9000.

The Marion Machine, Foundry & Supply Company, Marion, Ind., has increased its capital stock from $35,000 to $45,000.

Plans are being prepared for the construction of a municipal electric light plant at Waynetown, Ind.

The Central South

LOUISVILLE, KY., September 2, 1913.

A striking indication of the condition of business among the machinery manufacturers of this section is the fact that most of the plants have run straight through the summer without cutting down their force or reducing the amount of time from normal. As a midsummer lethargy is usually expected, and the manufacturers are prepared for it, the activity which has ruled during the current season has been the more appreciated. General political conditions and the local crop situation were both expected to militate against business of large proportions. That it has gone ahead during the usually dull months is taken as a good indication of active business during the fall. Boilers continue to lead in the demand, with woodworking equipment and machine tools also in good call.

The Made-in-Louisville Exposition, held last week, exhibits being shown in the windows of downtown retailers, included a number of machinery houses. The James Clark, Jr., Electric Company, electrical equipment; the Universal Swing Joint & Machine Company and the Abell Elevator Company were among those which displayed their products.

The Dixie Mfg. Company, Louisville, has been formed for the manufacture of motorcycle specialties, including tandem seats, luggage carriers, accelerators, etc. The company will equip a shop at 701 East Broadway for assembling and finishing, and will let contracts for the manufacture of the parts. The equipment which will probably be needed includes a motor-driven drill, a punch, a small nickel-plating outfit, etc. A. F. Wolke, manager of the company, may be addressed.

The Louisville Board of Trade has taken cognizance of the report that the United States Cast Iron Pipe & Foundry Company is considering closing its local plant and discontinuing operations here, by the appointment of a special committee to confer with executives of the company. J. M. Johnson, president of the Louisville Bridge & Iron Company, is a member of the committee. D. Long, grandson of Dennis Long, who founded the plant, which was taken over when the United States Company was formed, is resident manager for the company in Louisville.

The American Stone Company, Floyds Knobs, Ind.,

across the river from Louisville, will purchase crushers for reducing ore at Butterfield, Ark., where it is interested in a mining property.

The city of Henderson, Ky., will improve its electric light plant equipment at a cost of about $25,000. The mayor should be addressed.

A new factory will be erected by the Imperial Wire & Iron Works, Louisville, Ky., to be located at Twen fourth and Maple streets.

The Continental Coal Corporation, Pineville, Ky., is in the market for a 150-hp. boiler. Used equipment will be considered. White L. Moss is vice-president and general manager.

Hon & Tomlinson, Winchester, Ky., will build a sawmill at Blackey, Detcher County. Address the firm at Winchester.

An electric passenger elevator and a heating plant will be purchased by Frenkel Bros., Hopkinsville, Ky., in connection with the remodeling of their mercantile building.

The Standard Planing Mill & Building Company, Ashland, Ky., suffered the loss of part of its plant by fire last week. It has been decided to rebuild, and a considerable quantity of woodworking equipment will be needed.

Lawrenceburg, Ky., is considering issuing $15,000 bonds for the purpose of improving its waterworks plant, in case the property is not sold.

The People's Laundry Company's plant at Henderson, Ky., was destroyed by fire last week. Power and special equipment will be needed in case rebuilding is decided upon.

The Selby Shoe Company, Ashland, Ky., will erect an addition containing 4000 sq. ft. The company's headquarters are at Portsmouth, Ohio.

The city of Maryville, Tenn., has plans for the installation of a water works plant. Address the mayor.

The Franklin Ice Company, Franklin, Tenn., will construct a factory costing $20,000 to take the place of the plant which was recently burned.

Sobel Bros., Nashville, Tenn., will probably require machine tools for an automobile repair shop which they have started work on.

The city of Tallapoosa, Ga., is asking for figures on a 60-kw. direct-connected engine.

F. A. Ramdall, Haines City, Fla., is asking for prices on a heavy-duty freight elevator.

An ice factory will be equipped in connection with the power plant of the Chipley Light & Power Company, Chipley, Fla., it is reported. C. H. Hale is engineer.

The Southern Land & Investment Company, Ft. Myers, Fla., plans the establishment of an ice factory.

Percy Hagerman is contemplating the erection of electric light, water and ice plants at Lake Worth, Fla.

The capacity of the factory of the Orlando Ice Company, Orlando, Fla., will be increased from 20 to 60 tons, and plans for an addition have been drawn.

Birmingham

BIRMINGHAM, ALA., September 1, 1913.

Confidence in the crop yields both of corn and cotton has stimulated the machinery trade, which had been good all the summer. Country merchants are purchasing implements and oil mills and ginneries are buyers of engines and boilers. Structural work is extensive and continues to call for a variety of machine tools. Gasoline engines are good sellers. The general trade is good and the tendency is to improve.

The James Foundry Company has been organized and has taken over the old steel foundry in Ensley. It will be remodeled and cast-iron culverts manufactured.

The Brannon & Thompson Lumber Company will establish a sawmill with a capacity of 20,000 ft. at Ashville, Ala.

C. H. Green will establish a sawmill at Anniston, Ala.

Clanton, Ala., has voted bonds for establishing waterworks system. Dr. A. A. Matthews is mayor.

Watt T. Brown, J. T. Brown, McNeill Bros. and H. N. Quillan, of Ragland, Ala., have organized a company for the purpose of establishing a heading mill. The construction of buildings has begun.

George R. Burton, Roland G. Spearman and associates of Talladega, Ala., have organized a company with $15,000 capital stock for the purpose of establishing a heading and stave mill.

The Edwards Cotton Oil Company, Ozark, Ala., has been incorporated with a capital stock of $10,000 by W. L. Edwards and associates, who propose to establish a cotton seed oil mill.

Robbins & McGowin, Brewton, Ala., are reported to be planning to establish a fertilizer plant.

The Standard Foundry Company, Anniston, Ala., has been incorporated with a capital stock of $100,000 by F. Morris, J. B. Carrington and others to manufacture soil pipe and fittings.

The Columbiana Ice, Light & Power Company, Columbiana, Ala., has been incorporated with a capital stock of $25,000 by J. H. Crumpton and others. It will erect an ice factory and power house.

The Kentucky Lumber Company, Cincinnati, Ohio, will construct a bandmill at Sullogent, Ala., and will also be in the market for equipment for a 12-mile logging railroad.

G. G. Vaughan and others, Selma, Ala., are organizing a company to manufacture spark plugs for use on automobiles, motorcycles, etc.

Franklin F. Davis, Atlanta, Ga., has been appointed Southern representative of the Diamond Iron Works, Minneapolis, Minn., manufacturer of sawmill and transmission equipment. He will make his headquarters at Atlanta.

The Pinehurst Fertilizer Company, Pinehurst, Ga., has been incorporated with a capital stock of $10,000 by M. C. and M. A. Peavy and associates. It will establish a dry mixing plant with a daily capacity of 100 tons.

The Lake Gin Company, Lake, Ga., has been incorporated with a capital stock of $10,000 by W. S. Shiflet, B. H. Harris and others and will build a cotton ginning plant.

The Perfection Index & File Company, Savannah, Ga., incorporated with a capital stock of $100,000 by C. B. and William B. Stillwell, Savannah, Ga., and associates, proposes to build a factory to manufacture filing systems.

The Wilkinson Machine Company has purchased a site at Savannah, Ga., and will establish a marine repair and general machine shop. Charles G. Wilkinson is manager.

The city of Ludowici, Ga., proposes to establish a lighting plant.

The Dupont Canning Company, Dupont, Fla., has been incorporated by H. E. Black, H. R. Van Dusen and others. It will establish a vegetable canning plant.

The Southern Land & Investment Company, Fort Myers, Fla., contemplates establishing a canning plant.

The city of Fernandina, Fla., has voted $50,000 bonds to establish an ice factory and construct a new dock. Address the mayor.

St. Louis

ST. LOUIS, MO., September 1, 1913.

The machine tool business at the present time is chiefly local, though the inquiry from St. Louis territory generally has shown improvement, with some few sales. The uncertainty developing from the crop damage scare has not entirely dispersed, but there are indications of a better feeling with the actual appearance of definite figures on which to base calculations as to the future. While certain sections have suffered, both in the corn and the cotton belts, the territory generally will be in good condition. Second-hand demand is small.

The Best Clymer Mfg. Company, St. Louis, which was recently incorporated, will build a canning and preserving plant at once at a cost of about $100,000. It will also install hermetical sealing and sterilizing equipment. It will be in operation about January 1. M. C. Clymer is president.

The American Mfg. Company will erect and equip an addition to its St. Louis plant operated under the name of the St. Louis Cordage Company.

The Anselm-Ganahl Motor Car Company, St. Louis, has been incorporated with a capital stock of $15,000 by Roy W. Anselm, Leo F. and Richard J. Ganahl to equip a repair shop for automobiles, motors, etc.

The equipment for the addition previously announced to the plant of the Banner Buggy Company, St. Louis, will require an expenditure of about $30,000 and will be capable of producing 250 complete buggies daily.

The Coyne Automobile Company's building at 900 Cass avenue, St. Louis, was destroyed last week with its repair shop, etc., the total loss being about $60,000.

The Missouri Baptist Sanitarium, St. Louis, plans an addition to cost $100,000, involving considerable special equipment, including elevators, etc.

The Commercial Foundry Company, St. Louis, has been incorporated with a capital stock of $25,000 by F. P. Gibbs, John P. Becker, D. Butts and others, to engage in a general foundry business.

The Pneumatic Steel Tire Corporation, St. Louis, has been incorporated with a capital stock of $150,000 by A. Schwartz, C. A. Seifert, F. E. Olcott, J. M. Hartz and others to equip a plant for the manufacture of pneumatic steel tires, a patented device for automobile use.

The Golden Grain Milling Company has broken ground for the erection of a $100,000 plant in East St. Louis. D. B. Fraser is president, C. B. Williams vice-president, Charles P. Wolverton secretary and general manager, and Edwin L. Solfisburg treasurer.

The International Mop Mfg. Company, Kansas City, Mo., has been incorporated with a capital stock of $50,000 by E. P. Hickman, A. H. Dolman and A. E. Hickman to manufacture a patented device.

An electric light and power plant is to be built at Howard, Kan., under plans which have been prepared by the W. K. Palmer Company, engineers, Kansas City, Mo.

The Linde Air Products Company, whose main office is in the Forty-second Street Building, New York City, has purchased a site in North Kansas City, Mo., and plans will immediately be drawn for the erection of a building to cost between $150,000 and $200,000. The company already has established plants at Buffalo, Chicago, Detroit, Cleveland and other industrial cities. While the ultimate size of the new factory has not been definitely decided upon, the present proposal is to construct a plant with a capacity for 15,000,000 cu. ft. of oxygen per year.

The Thorp-Allen Motor Company, Kansas City, Mo., has been incorporated with $10,000 capital by William J. Thorp, H. B. Thorp and H. L. Allen.

The Allen Stamp, Seal & Mfg. Company, Kansas City, Mo., has been incorporated with a capital stock of $2,000 by George H. Allen and Richard Henry to equip a plant for the manufacture of stamps, seals, etc.

The Swan Machinery Company, Joplin, Mo., is reported to be in the market for air compressor equipment.

The Malang & Stevens Machinery Company, Joplin, Mo., is in the market for pipe cutting and threading machinery.

The Wellington Light & Power Company, Wellington, Mo., has been incorporated with a capital stock of $16,000 by Walter J. C. Westerman, W. H. Breuer and H. H. Neese and will equip and operate a public service plant.

The Missouri Public Utilities Company has completed plans for the acquisition of the Astor plant at Chaffee, Mo., and for the improvement of its equipment. Address J. J. Astor, Cape Girardeau, Mo.

The Missouri Electric, Gas & Water Company, Gainesville, Mo., has completed plans which involve the installation of alternating current generators, a rotary converter and other electrical equipment.

The Gattermeier Milling Company, California, Mo., has enlarged its capital from $5000 to $18,000 and will increase the equipment of its flour and feed mill.

The Wisconsin Lumber Company, Harvester Building, Chicago, Ill., is building a sawmill at Deering, Mo., to have a capacity of 75,000 ft. of hardwood lumber daily. The cost of mill and equipment will be about $80,000.

The Myers Stave & Mfg. Company of Piggott, Ark., has been incorporated with a capital stock of $25,000 by J. M. Myers, J. H. Myers and G. W. McMillion.

A cotton gin requiring about $6,000 of equipment will be built at Argenta, Ark., by E. A. Parnell of Dallas, Tex.

The Farmers' Union Gin & Milling Company of Vanndale, Ark., has been incorporated with a capital stock of $8750 by J. C. Hefley, T. D. Hare and W. H. Wolf, and will equip a gin and compress.

The city of Prairie Grove, Ark., wil install an electric light and waterworks plant to cost about $50,000 under the direction of the mayor.

The Mann Motor Car Company, Pine Bluff, Ark., has been incorporated with a capital stock of $10,000 by J. H. and W. D. Mann to equip a garage and repair shop.

The Missouri & North Arkansas Railroad will equip a round house and machine shop at Heber Springs, Ark. E. M. Wise, Eureka Springs, Ark., is general manager.

The W. W. Wilson & Wrape Stave Company, Argenta, Ark., will enlarge the plant and add considerable new equipment.

The Sutton Stave Company, Heber Springs, Ark., has been incorporated with a capital stock of $10,000 by George H. and John W. Welch and S. G. Sutton to equip a stave manufacturing plant.

The McEwen Company, Tulsa, Okla., will equip a foundry and blacksmith shop for the purpose of making and repairing oil well apparatus and supplies.

The Oklahoma Threshing Machine Company, Oklahoma City, Okla., is to be incorporated with a capital stock of $50,000 by D. A. Radle and others to equip a plant for the manufacture of small threshing machines. Machinery is being sought for the plant.

The O. O. Rossan Clickless Lock Railway Joint Company has been incorporated with a capital stock of $50,000 at Dustin, Okla., by O. O. Rossan, L. T. Sheets and others.

G. B. Merrill & Bros., Lake, Miss., whose large sawmill was burned recently with $60,000 loss, have decided to rebuild.

The Marathon Lumber Company, Wausau, Wis., has decided on the details of the sawmill it is to build at Laurel, Miss. It will have a daily capacity of 125,000 ft., and will cost about $75,000.

The Mississippi Mfg. Company of Crystal Springs, Miss., has increased its capital from $50,000 to $100,000 and will add to its equipment for the manufacture of boxes, crates, etc.

The Farmers' Oil Company, Ltd., at Welsh, La., has been incorporated and will equip a plant for the manufacture of cotton seed oil, etc.

The Hammond Planting & Mfg. Co., Hammond, La., will considerably increase the equipment of its cotton gin.

A power and ice manufacturing plant will be equipped at Houma, La., at once by J. H. Jastremski.

The Planters' Fertilizer Company, at Kenner, La., will equip for operation by electricity, including a 500-hp. motor. Current will be obtained from New Orleans.

The Federal Fruit & Cold Storage Company, New Orleans, La., has been incorporated by C. H. Ellis, E. G. Simmons and James L. Wright with a capital stock of $300,000.

The Caddo Levee District has plans for about 1,000,000 cu. yd. of excavation and is in the market for machinery. Address J. M. Sentell, Shreveport, La., president.

The Lake Charles Grain Company, Lake Charles, La., will build a grain elevator and a feed mill at once, plans therefor having been completed.

The city of Alexandria, La., has made appropriations for the extension of its water works plant and well system. The mayor is in charge.

The Levert Lumber & Shingle Company, Lottie, La., will install equipment for the manufacture of excelsior and wood wool. Machinery is being sought.

A stave manufacturing plant with equipment to cost about $25,000 will be established at Monroe, La., by the Brown Stave Company.

The Poitevent & Favre Lumber Company, Mandeville, La., will erect a sawmill with a capacity of 100,000 ft. a day, at an estimated cost of $200,000.

The Hammond Box & Veneer Company, Hammond, La., will enlarge its plant, which is used for the manufacture of strawberry boxes. Veneer cutting equipment will be the principal requirement.

The city of Baton Rouge, La., is reported to be considering the construction and equipment of an electric light plant to be operated in connection with a proposed garbage reduction plant.

The city of Welsh, La., is to issue $15,000 bonds for the purpose of building an electric light plant.

The Burton-Swartz Lumber Company, Burton, La., is considering the erection of a large sawmill on one of its Florida timber tracts.

Texas

AUSTIN, TEXAS, August 30, 1913

Good rains have improved late crop conditions, particularly cotton. Money from the sale of cotton already picked is flowing into different channels of trade, and machinery and implement dealers are feeling the good effects of general business revival.

The Weatherford Water, Light & Ice Company has increased its capital stock from $80,000 to $90,000 and will make improvements to its plants.

The Forney Cotton Oil Company is installing a refinery at its cotton-seed oil mill at Forney.

W. W. Perry and associates are erecting a cotton-seed oil mill at Mineola.

The Farmers' Gin Company is erecting a cotton gin at Plano.

J. F. Knight is erecting bottling works at Sulphur Springs.

J. W. Simmons of Quanah and associates will erect a cotton gin at Roaring Springs.

The McEwen Mfg. Company will erect a foundry and machine shops at Tulsa, Okla.

The Jefferson Cotton Oil & Fertilizer Company, which is erecting a cotton-seed oil mill and fertilizer

factory at Jefferson, Texas, expects to have the plants finished by October 1.

It is announced that the general shops of the Trinity & Brazos Valley Railroad at Teague, Texas, which were recently destroyed by fire with a loss of about $200,000, will be rebuilt.

The Velasco Power Company, Velasco, Texas, has been incorporated with a $3,000 capital by J. T. Dingle, D. T. Austin and P. F. Combs.

The Forney Cotton Oil Company, Forney, Texas, is erecting a refinery at its plant.

Madisonville, Texas, will construct a waterworks plant.

The Pacific Coast

PORTLAND, ORE., August 26, 1913.

The demand for machine tools shows a little more life, and inquiries have come out for a few fairly good groups, on which some business has been done. The larger part of the business, however, is in single tools, usually of an unimportant nature. Most lines of miscellaneous machinery are quiet, though there is considerable divergence in reports from different quarters, and some lines seem to be moving well. The demand for mill and logging equipment is hardly up to expectations, yet work is proceeding on many new logging and mill projects, and sales of locomotives, cars, logging engines, etc., are in the aggregate satisfactory. Notwithstanding the slump in coastwise shipping, new steamers are still being built at various shipyards in this vicinity, and will be equipped with elaborate lumber handling outfits. Bankers' statements and crop reports are encouraging, but a large amount of development work is held in abeyance by lack of money. Export business to the Orient has been a prominent factor this summer, and important development along this line is expected in the future. While many of the shipments were from Eastern manufacturers, several large orders for special machinery and railroad equipment have been filled by Pacific coast plants.

Bids will be taken September 13 for the construction of buildings for the shipfitters' shop, mold loft, boiler shop and structural steel storage buildings for the Puget Sound Navy Yard, the estimated cost being $265,000.

The Inland Empire Paper Company, near Spokane, Wash., is making additions to its plant which will increase the capacity from 10 to 50 tons per day.

The Swedish Steel Corporation, Seattle, Wash., has been incorporated with a capital stock of $100,000 by Olaf and A. Bergstrom and C. J. Smith.

The Oregon Lumber Company's box factory at Baker City, Ore., is preparing to put in a new 300-hp. Corliss engine. The Allis-Chalmers Company has the order for the company's new sawmill at Dee, Ore.

The Higgins Machinery Company, Seattle, Wash., recently shipped two sawmill outfits to Alaska.

Bids will be taken shortly for a hydroelectric plant for the town of Eatonville, Wash.

The Hamilton Creek Logging Company, Portland, is having 13 logging engines equipped with Glafke oil-burning devices.

The Hofius Steel & Equipment Company, Seattle, is building a warehouse at Tacoma, Wash.

The Dickey-Angel Lumber Company, operating a mill near Snohomish, Wash., is preparing to start a large logging camp, with a connecting railroad, near Fort Ludlow.

The Seattle office of the Lidgerwood Mfg. Company has been moved to 809 Western avenue.

The National Ice Company has commenced the construction of a new plant in Portland.

The Broderick & Bascom Rope Company, Seattle, is having plans drawn for the enlargement of its plant.

The Phillips Land Clearing Machinery & Contract Company, Seattle, has been incorporated with a capital stock of $150,000 by H. L. Phillips, M. Wood, and others.

The city of Portland is preparing plans for a municipal asphalt paving plant.

The Northwestern Wooden Ware Company, Tacoma, Wash., announces that the plant recently burned will be rebuilt at once at a cost to exceed $100,000.

The California Iron Works, San Diego, Cal., will soon begin the erection of a large machine shop and foundry on the tidelands at the foot of Seventh street. Pattern, blacksmith, ornamental iron shops and a pattern warehouse are also planned. The company is preparing to call for bids for the foundry, which will be 70 x 180 ft., of corrugated iron construction.

Eastern Canada

TORONTO, August 30, 1913.

The Electric Steel & Metal Company, Welland, Ont., is erecting its new plant. The first building will be of brick and steel construction, 40 x 300 ft., and will be erected for the steel castings department. Plans for the other buildings will be prepared at once. Turnbull, Welland, is president; J. H. LeFevre, Welland, vice-president; E. Carnegie, London, England, secretary-treasurer. E. Carnegie and W. L. Renton, director from Edinburgh, Scotland, will locate in Welland and take part in the management of the company.

The B. F. Goodrich Tire & Rubber Company, Akron, Ohio, has decided to build a large Canadian branch at Toronto.

C. S. Trotter, manager of the Standard Clay Products, Ltd., New Glasgow, Nova Scotia, states that his company is doubling its establishment. When the proposed changes are made it will have a plant identical in size with the central plant at St. Johns, Que. The enlarged plant will be in operation by October 1. The output will then be 3000 cars per annum of piping, flue lining, building blocks and junctions.

The Monarch Optical Mfg. Company, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by F. M. McDowell, G. R. Sproat, K. W. Wright and others to manufacture optical goods.

The Tocan Mfg. Company, Ltd., Dundas, Ont., has been incorporated with a capital stock of $250,000 by W. A. Welsh, A. C. Cauldwell, T. J. Palmer and others to manufacture tin, copper and brass ware.

The Tube & Pipe Bending Company of Ontario, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by J. F. Edgar, J. E. Mabee and others.

The Canadian Tobacco Utilities, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by A. Hawes, Grace E. Hawes, A. L. May and others to manufacture machines.

The Perfect Knitt Mills, Ltd., has closed negotiations with the town of Listowell, Ont., for a loan of $10,000, and a sweater manufacturing plant will be started at once there. The machinery of the Keystone Knitting Company of Georgetown, Ont., is to be moved to Listowell. New machinery will be added. Max Becker is at the head of the new company. It is expected that the plant will be ready for peration about October 15.

Publicity Commissioner MacDonald has secured a new industry for Guelph, Ont., to take over the plant formerly occupied by the Dominion Axle Works Company. The new company, which will be known as the Guelph Brass Foundry Company, will manufacture various kinds of brass castings. E. L. Tolmie, A. Thompson, Harley Haislip and C. Koblaskie are interested.

The Tudhope Motor Company, Ltd., has been sold to the Fisher Motor Company of Walkerville, Ont., including the plant and machinery. The new company will take possession at once and will operate the factory at Orillia, Ont., during the fall and winter, at least until the stock and material on hand has been made up. The factory has been practically shut down for three months.

A silverware factory will be erected by the Canadian Rogers Company, Ltd., Toronto, on King street, near Brant. The plant will cost $25,000.

What is claimed to be the largest single order of stamps for a Canadian concentrator was placed last week by the Canadian Northern Customs Concentrator, Cobalt, Ont., with the Power & Mining Machinery Company for 80 stamps. The stamps are to be delivered within 60 days at Cobalt.

The Agricultural Implements Mfg. Company, Ltd., Quebec, Que., has been incorporated with a capital stock of $75,000 by F. C. Dufour, A. Bilodeau, L. Turcotte and others.

The Southern Canada Power Company, Ltd., Montreal, has been incorporated with a capital stock of $3,000,000 by C. H. Cahan, O. B. MacCallum, M. Lewis and others.

Thomas Ogilvie & Sons, Ltd., Toronto, has been incorporated with a capital stock of $200,000 by A. M. Garden, C. A. Moss and others to manufacture woolens, silks, linen, etc.

The Herendeen Flour Company, Ltd., Toronto, has been incorporated with a capital stock of $5,000,000 by T. G. Watson and J. L. Mallory.

The American Kitchen Products Company of Canada, Ltd., Montreal, has been incorporated with a capital stock of $30,000 by W. J. Schieffelin, H. S. Livingston, B. L. Weil and others to manufacture concentrated food.

The Ecothermal Stove Company of Canada, Ltd., ingsville, Ont., has been incorporated with a capital ock of $100,000 by B. Jasperson, G. Jasperson, C. J. reen and others to manufacture cooking and heating pliances.

William Clark, Ltd., Montreal, has been incorpored with a capital stock of $500,000 by R. L. Shanks d others to manufacture canned goods.

The International Chemical Company, Bridgeburg, nt., recently incorporated with a capitalization of 00,000 to manufacture paints under a patented proc- s, has secured temporary manufacturing quarters on ourtright street, but is having plans prepared for an tensive new plant to be erected next spring.

The Tocan Mfg. Company, recently incorporated at undas, Ont., with capital stock of $250,000, has pur- ased a plant at that place, which it is equipping with achinery for the manufacture of various kinds of eet metal goods.

The Brantford Machine & Foundries, Ltd., Brant- ord, Ont., is erecting a foundry building which will ost, with equipment, about $40,000.

The Langhead Machine Company, Sarnia, Ont., will rect an extensive addition to its machine shop on the ver front for the production and repair of machinery r the marine trade.

The Beaver Companies, Buffalo, N. Y., are complet- g a large plant at Thorold, Ont., which will not only ake their completed specialty but also raw material r the American factories. This is the second factory f the Beaver Companies in Canada, the other being at ttawa. The power plant at Thorold will generate 6500 p. All contracts, with the exception of a few minor etails, have been let.

Western Canada

WINNIPEG, August 30, 1913.

The demand for machinery and parts is fair, with the utlook for next season encouraging. It is not likely hat there will be any great activity this fall, and most f the development work that was postponed on ac- ount of the financial stringency will not be resumed ntil after the first of the year. Leading financial men re of the opinion that the general money situation is radually getting better, but the improvement is not ufficient to result in much change in the industrial field n the next two or three months. There is a steady ovement of machinery supplies, but trade is not by ny means as active as at the corresponding time last ear.

Plans for the new Royal Jubilee hospital, Victoria, . C., are completed and the work of building it will tart about the first of the year. It will cost in the eighborhood of $800,000.

W. C. Dunn, Edmonton, Alberta, secretary-treasurer f the Wabanum Power & Coal Company, announces hat he and his associates contemplate erecting a large uilding to accommodate a number of small manu- acturing concerns. Electrical power will be used to rive the machinery, and the building will be provided with modern lighting and heating systems.

It is reported from Calgary, Alberta, that the Al- erta Farmers' Elevator Company will erect 46 more levators in time to assist in the handling of this sea- on's grain crop.

The sawmill of the Valley City Lumber Com- any, Ltd., Valley City, near Red Deer, Alberta, burned a few days ago. The plant will be rebuilt, and con- iderable new machinery will be required.

The Keystone Portland Cement Company, Ltd., Calgary, Alberta, proposes to erect a large plant at Blairmore, Alberta, to manufacture lime, brick and cement. The cost of the plant is placed at $500,000.

It is now reported that work on the Dominion Government interior storage elevators at Moose Jaw and Saskatoon will start early in October, and that bids will be received until September 10.

The planing mill of the Big River Lumber Company, Ltd., Big River, Saskatchewan, burned this week. It will be rebuilt. Three months ago the sawmill of the company burned with great loss, and it is reported that instead of rebuilding the mill a number of smaller plants will be erected at the different timber limits of the company.

The Saskatchewan Abattoirs, Ltd., Prince Albert, Sask., is preparing to erect a cold storage and packing plant. James O'Callaghan is the managing director.

The Empire Lumber Company, Ltd., Vancouver, B. C., contemplates erecting a lumber mill at Crofton, B. C. The company is also starting active operations in the development of its timber holdings in the Cowichan Lake district on Vancouver Island, B. C.

The town council of Neepawa, Manitoba, will shortly call for bids for two 150-hp. boilers and a generator unit. The engineer is W. E. Skinner, 204 Sterling Bank Building, Winnipeg.

The Ontario Steam Laundry Company, Calgary, Alberta, is planning to erect a steam laundry at a cost of about $100,000. Christie Bros., Calgary, are the proprietors. The architect is D. S. McIllroy.

Calgary Flour Mills, Ltd., Calgary, Alberta, has been incorporated with a capital stock of $5,000,000 by W. C. Robertson, A. Winter and others.

Under the name of the Canada Whole Wheat Flour Company, a new plant has been established at 1230 Hamilton street, Vancouver, B. C., by local capitalists, with a capacity of 25 to 30 bbls. per day. The company expects soon to have additional machinery which will increase the output to about 150 bbls. per day. F. A. Thompson, H. F. Chapin, M. A. Rombough and William Curtis are interested.

The Great West Brick & Coal Company has completed its arrangements for the installation of a brick plant at Estevan, Sask., to have a capacity of 100,000 bricks per day.

The Dominion Canners, Ltd., has purchased the cannery at Vernon, B. C. The plant is being overhauled and new machinery installed.

It is announced that the Winnipeg Electric Railway Company, Winnipeg, Man., will build another power plant at Grand Bonnet Falls, 12 miles farther down the river toward Lake Winnipeg. J. G. White & Co., New York, will construct the plant. The cost will be about $5,000,000.

The Fort Qu'appelle Boat Building & Wood Working Mfg. Company, capitalized at $50,000, will soon erect a plant at Fort Qu'appelle, Sask. George Grass, of Sintaluta, will be in charge.

Fire destroyed the new sawmill of the Valley City Lumber Company, 40 miles west of Red Deer, Alberta. W. H. Cushing, Calgary, is president.

The Fort William Starch Company has awarded the contract for the erection of its plant at Fort William, Ont., to the Canadian Stewart Company, also of Fort William. The plant will cost $750,000.

Government Purchases

WASHINGTON, D. C., August 28, 1913.

Bids will be received until October 11 by the Bureau of Yards & Docks, Navy Department, Washington, for refrigerating equipment and building construction for the navy hospitals at Chelsea, Mass., Portsmouth, N. H., Newport, R. I., and Norfolk, Va. The estimated cost is $25,000. Bids will be received until October 18 for an ice-making and cold-storage plant for the naval station, Pearl Harbor, Hawaii. The amount available is $15,000.

Bids will be received at the office of the superintendent U. S. Capitol Building and Grounds, Washington, D. C., for a lighting, heating and power system for the court house, Washington. Address Elliott Woods, superintendent.

Bids will be received by the quartermaster, Washington, D. C., until September 10, for a power system.

Bids will be received at the office of the general purchasing officer, Isthmian Canal Commission, Washington, D. C., until September 17, for a self-propelling track pile driver.

Bids were received at the Bureau of Supplies and Accounts, Navy Department, Washington, until August 26, for supplies for the navy yard as follows:

Schedule 5664—Engineering

Class 45, Mare Island—Two turbo-generator sets, 50 kw., and spare parts: DeLaval Steam Turbine Company, $9830; General Electric Company, $9416; Howell Ross Hansen, $7328; Terry Steam Turbine Company, $5880 and $4985.

Class 45, Mare Island—Two turbo-generator sets, 50 kw., and spare parts—f.o.b. works: DeLaval Steam Turbine Company, $9455; General Electric Company, $9060.50; Howell Ross Hansen, $6968; Terry Steam Turbine Company, $5630.

Class 46, Mare Island—Two turbo-generator sets, 100 kw., and spare parts: DeLaval Steam Turbine Company, $14,940; General Electric Company, $11,310; Howell Ross Hansen, $12,112; Terry Steam Turbine Company, $8780.

Class 46, Mare Island—Two turbo-generator sets, 100 kw., and spare parts: DeLaval Steam Turbine Company, $14,148; General Electric Company, $10,835.50; Howell Ross Hansen, $11,752; B. F. Sturtevant Company, $6614; Perry Steam Turbine Company, $8380.

Trade Publications

Gas Producer.—Jacobson Engineering Company, Hagerstown, Md. Circulars. Deal with a gas producer for generating gas from kerosene, gas engine distillate, gas oil or any other grade of fuel suitable for use in oil engines, and one of the suction type using anthracite coal. Both producers are illustrated, and brief descriptions are given in both circulars.

Milling Machines.—Ingersoll Milling Machine Company, Rockford, Ill. Bulletin No. 34-FR. Gives general description and specifications for a line of fixed rail, multi-spindle milling machines. Following the general description, views are given of the various types of machines, which are built with various numbers of spindles from two to seven and different numbers of heads up to five.

Crucible Tool and Special Steels.—Vulcan Crucible Steel Company, Aliquippa, Pa. Catalogue No. 5. Is devoted to the manufacture of high grade crucible tool and special steels by the Siemans-Martin process, and shows the development which has taken place in this industry. The various stages in the manufacturing process are illustrated with brief text descriptions. This is followed by short descriptions of the various kinds of tool steel made by this company, together with the different tempers. Points on hardening and grinding the steels are given, and a number of tables of useful information, such as the different steel classifications, weights of various shapes and decimal equivalents are included.

Steam Traps.—H. A. Rogers Company, 87 Walker street, New York City. Pamphlet. Deals with the Heintz steam trap, for which this firm is the sole American sales agent. The trap consists of but four parts, only one of which is movable. After a brief introduction dealing with its uses, a description of the trap is given, supplemented by halftone engravings and line drawings. Directions for setting the trap are included, and mention is made of a steam trap for radiators which operates on the same principle. A number of testimonial letters are also included.

Grinding Machines.—Sterling Grinding Wheel Company, Tiffin, Ohio. Two circulars. The first is concerned with a two-wheel grinding and polishing machine designed for foundries, saw factories, machine shops, etc., and a tilting vise, which can be held in any position, from the horizontal to the vertical. The other circular refers to a line of knife grinding machines, which includes both straight and cup wheel types. In both circulars views of the different machines are given, with brief descriptions and tables of specifications.

Hydraulic Transmission Gear.—Waterbury Tool Company, Waterbury, Conn. Booklet. Concerned with the Waterbury hydraulic speed gear, which was illustrated in *The Iron Age*, May 29, 1913. This gear is a machine for transmitting rotary power at variable speeds in either direction without steps or abrupt gradations while the source of power rotates continuously in one direction without any necessary change of speed. A complete description of the gear, supplemented by a number of halftone engravings, is given, and directions for taking the gear apart are also included.

Self-Oiling Bearings.—Dodge Mfg. Company, Mishawaka, Ind. Folder. Gives general description and specifications for a self-lubricating bearing which can be furnished in all of the standard types. The advantages of this bearing as compared with the old style, which has to be oiled at frequent intervals and is apt to cause accidents, are briefly touched upon, and a number of illustrations showing different forms in which this bearing can be supplied are included.

Chaplets and Anchors.—Philadelphia Chaplet & Mfg. Company, Philadelphia, Pa. Price list No. 3. Concerned with a line of foundry chaplets and anchors which are made in a number of different sizes and styles. These include double head, saddle back, crown, perforated and ventilated chaplets and single and upset head anchors. All of these are illustrated and tables giving the various sizes in which they can be supplied are included.

Asbestosteel.—Asbestos Protected Metal Company, Beaver Falls, Pa. Bulletin No. 53. Deals with the use of steel protected by asbestos for both permanent and temporary construction, and especially for roofs and curtain walls. A description of Asbestosteel, which consists of three essential elements, asbestos-protected metal, steel wire reinforcement and concrete, is given, together with data on its properties and uses. A number of views of buildings upon which this has been used are given, together with a number of tables of useful information.

Baking Ovens.—Hermann Gehnrich, 60 Franklin avenue, Brooklyn, N. Y. Catalogue. Calls attention to a line of sectional portable ovens that are used for japanning, enameling, core baking, drying, lacquering and baking, and especially to an indirect gas-heated radiator type of oven, in which the burners are inclosed in separate chambers that are entirely independent of the wall construction. These ovens, which are made in a number of different styles for handling various classes of work, are all illustrated, with brief descriptions, emphasis being laid on the construction of the outer walls and the advantages of gas as a heating fuel. A partial list of users of these ovens giving the work handled is included.

Portable Electric Grinding Machines.—Chicago Pneumatic Tool Company, 1010 Fisher Building, Chicago, Ill. Bulletin No. E-29, superseding No. E-24. Illustrates the Duntley electric grinding machines, which are made in portable, tool post, pedestal, bench and internal and external types. Descriptions of these chines, which are supplied for use on direct-current circuits with the exception of the portable and external and internal chines, are given. The heavy duty portable machine, which pecially adapted for use in foundries, machine and structural and for grinding rail joints on street railways, and the external internal grinding machines can be supplied for use on either or alternating current circuits. Mention is made of a port grinding machine which, if desired, can be used for grinding surfaces.

Steam Turbines.—De Laval Steam Turbine Company, T ton, N. J. Pamphlet. Describes several methods of connec small turbines for driving auxiliaries in large steam power pl and in connection with exhaust steam heating and drying sys in isolated plants. One arrangement particularly recommended the heating system is a low-pressure turbine to be installed in coun tion with an existing engine, the turbine being so connected tha can supply steam at atmospheric pressure for heating purpo during the winter and operating on low-pressure steam from engine during the summer and exhausting to a condenser. A mo fication of this arrangement is the use of two turbines and no gine, the type of turbine recommended for this purpose being mixed flow unit, which is capable of running on low-pressure ste and exhausting into a condenser, high-pressure steam exhaust to the atmosphere, or high-pressure steam exhausting into a conden An illustrated article dealing with these methods of turbine conn tion appeared in *The Iron Age*, May 22, 1913.

Drill Chucks.—Standard Tool Company, 6900 Central aven Cleveland, Ohio. Folder. Devoted to an improved type of d chuck, which is provided with a face plate. Another feature of chuck is that the jaws do not project through the face plate, size of the hole in the latter fixing the size limit of the piece t can be inserted. Views of the exterior and interior of the chu together with the various parts are given, and there is a brief me tion of the various special features.

Centrifugal Pumps.—Henry R. Worthington, 115 Broadwa New York City. Catalogue No. W-204.25. Illustrates and describ briefly a few of the many applications of pumping machinery t irrigation and distribution of water for agricultural purposes, fr raising, etc. After a discussion of the apparatus used for this pu pose, together with instructions for its installation and operati and the laying out of an irrigation system, brief specifications various types of pumps are given, the text being supplemented b half-tone engravings. A number of tables of useful information the use and conveying of water are also included.

Safety Work in a Cincinnati Shop

The R. K. Le Blond Machine Tool Company, Cincinnati, has issued for its employees a small book of rule and information on accident prevention. As part of th campaign for safety conducted by this company, a first aid room has been fitted up according to instruction given by the company's physician. It contains a cabinet in which are bandages, antiseptic washes and other conveniences; also a surgeon's chair and basin, stand, table and couch and a washstand with hot and cold water. All the furniture is of metal, finished in white enamel. Attendance is given by two men from the office who have been instructed regarding their duties by the physician. The latter, however, is promptly called in when a case requires it, or when there is doubt as to the extent or seriousness of the injury. Several meetings of all the foremen have been held, at which the various accidents were discussed as to the best method of treatment and the steps that should be taken to prevent a repetition.

Numerous first aid lectures have been given, with instructions in bandaging various parts of the body. A general inspection has been made of all equipment in the shop, and safety guards and appliances are being installed wherever possible. A committee is to be appointed every month, so that each foreman will take his turn in making an inspection of the shop. By this method it is expected to get the benefit of each man's experience in making the shop a safer place in which to work. The company has set out to do everything possible to reduce the liability of accidents, and to this end carefully instructs all employees, particularly the new ones, regarding their duties and the dangers connected with their work.

The red ball is used as a warning signal in various places, especially sharp turns or corners where either trucks or persons are liable to meet in collision. The red signs are used to warn against the opening or closing of switches or valves when this would endanger any one working on or near the line. An inflexible rule is that the man who displays the sign must remove it, and its removal by anyone else is strictly forbidden.